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A M E R I C A N

JOURNAL OF CONCHOLOGY.

VOLUME III.

PUBLISHED BY THE

Conchological Section of the Academy of Natural Sciences.

PUBLICATION COMMITTEE :

GEO. W. TRYON, JR., EDITOR,
ISAAC LEA, LL.D.,
C. F. PARKER.

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P H I L A D E L P H I A :

CONCHOLOGICAL SECTION OF THE ACADEMY OF NATURAL SCIENCES.

NEW YORK: Bailliere Brothers, No. 520 Broadway. BOSTON: Little, Brown & Co.

LONDON: Trübner & Co., No. 60 Paternoster Row.

PARIS: J. B. Bailliere et Fils, Rue Hautefeuille. MADRID: C. Bailly-Bailliere, Calle del Principe.

BERLIN: Asher & Co., No. 20 Unter d. Linden.

1867.

Part 1 published April 4th, 1867.

“ 2 “ September 5th, 1868.

“ 3 “ January 2d, 1868.

“ 4 “ April 2d, 1868.

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Jared P. Hartland

From a Photograph for the American Journal of Conchology 1867

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A M E R I C A N JOURNAL OF CONCHOLOGY.

N E W S E R I E S .

PUBLISHED BY THE

CONCHOLOGICAL SECTION of the Academy of Natural Sciences of Philadelphia.

VOL. III.

1867.

No. 1.

At a Business Meeting of the Academy of Natural Sciences of Philadelphia, held on the evening of Nov. 27th, 1866, the following paper was read by the Secretary and directed to be entered upon the Minutes:—

HALL OF THE ACADEMY OF NATURAL SCIENCES,
Philadelphia, Nov. 13th, 1866.

The undersigned members request that they may be constituted the Conchological Department of the Academy of Natural Sciences of Philadelphia.

(Signed)

ISAAC LEA,
GEO. W. TRYON, JR.,
S. R. ROBERTS,
F. V. HAYDEN,
JOS. JEANES,
W. S. W. RUSCHENBERGER,
H. ALLEN,

S. B. HOWELL,
WM. L. MACTIER,
ROBERT SWIFT,
T. A. CONRAD,
E. R. BEADLE,
JOS. LEIDY,
C. F. PARKER,

EDW. D. COPE.

At the meeting of the Academy held Dec. 26th, 1866, a resolution was adopted organizing the Conchological Department or Section, as above.

At a meeting of the founders of the Section, convened Jan. 3d, 1867, a temporary organization was effected, after which the following gentlemen were added to their number:—

CHARLES M. WHEATLEY,	Phoenixville, Pa.
PROF. S. S. HALDEMAN,	Columbia, “
JOHN FORD,	Philadelphia, “
JOSEPH C. TURNPENNY,	“ “
JOHN H. REDFIELD,	“ “
JOHN S. PHILLIPS,	“ “
WM. G. BINNEY,	Burlington, N. J.
A. D. BROWN,	Princeton, “

An election was then held for Officers of the Section, when the following gentlemen were chosen:—

Director—ISAAC LEA, LL. D.
Vice-Director—GEO. W. TRYON, JR.
Recorder—S. R. ROBERTS.
Treasurer—WM. L. MACTIER.
Secretary—REV. E. R. BEADLE.
Conservator—JOSEPH LEIDY, M. D.

Meeting, January 3d, 1867.

Ten members present.

MR. TRYON, Vice-Director, in the Chair.

Various donations to the Conchological Library and Museum were announced.

The Secretary read a note addressed to him by Mr. Tryon, offering to relinquish to this Section the future publication of the “American Journal of Conchology.” The offer was accepted.

The following gentlemen were then elected to serve on Standing Committees for the year 1867:—

1. *Library.*

C. F. PARKER, Librarian,
 JOSEPH JEANES,
 GEO. W. TRYON, JR.

3. *Finance.*

W. S. W. RUSCHENBERGER, Ch'n,
 ROBERT SWIFT,
 C. F. PARKER.

2. *Publication.*

GEO. W. TRYON, JR., Editor,
 ISAAC LEA,
 C. F. PARKER.

4. *Embryology and Anatomy.*

HARRISON ALLEN, M.D., Chm'n,
 PROF. E. D. COPE,
 JOSEPH LEIDY, M.D.

5. *Cephalopoda, Pteropoda
and Brachiopoda.*

S. B. HOWELL, M.D., Chm'n,
T. A. CONRAD,
GEO. W. TRYON, JR.

9. *Fluviatile Acephala.*

ISAAC LEA, Chm'n,
WM. L. MACTIER,
CHAS. M. WHEATLEY.

6. *Terrestrial Mollusca, (non-
operculate.)*

GEO. W. TRYON, JR., Chm'n,
WM. G. BINNEY,
C. F. PARKER.

10. *Marine Gasteropoda.*

ROBERT SWIFT, Chm'n,
C. F. PARKER,
JOHN FORD.

7. *Terrestrial Mollusca, (oper-
culate.)*

JOHN H. REDFIELD, Chm'n,
REV. E. R. BEADLE,
ROBERT SWIFT.

11. *Marine Acephala.*

T. A. CONRAD, Chm'n,
JOHN S. PHILLIPS,
JOS. C. TURNPENNY.

8. *Fluviatile Gasteropoda.*

CHAS. M. WHEATLEY, Chm'n,
PROF. S. S. HALDEMAN,
GEO. W. TRYON, JR.

12. *Palaeontology.*

F. V. HAYDEN, M.D., Chm'n,
T. A. CONRAD,
E. D. COPE.

13. *Lectures and Prizes.*

JOSEPH LEIDY, M.D., Chm'n,
W. S. W. RUSCHENBERGER, M.D.
HARRISON ALLEN, M.D.

OBSERVATIONS ON PLEIODON MACMURTRII.

BY T. A. CONRAD.

In the monograph of this genus in Reeve's *Conchologia Iconica*, this species is confounded with Swainson's *P. ovatus*. It is, therefore, I think, possible that a specimen of my species has never yet reached Europe, and none but the typical specimen has, to my knowledge, been brought to this country. I will therefore indicate the differences between the two species, and I am confident time will prove them to be distinct. The present shell is lighter, more ventricose, shorter or higher, with a more prominent summit and ventricose umbo, and is more obtuse posteriorly; within, the hinge differs in being narrower under the apex, and the teeth more regular except at the posterior end of the cardinal line. These teeth are very much compressed single and acute, whilst in the *ovatus* they incline more to be double; the posterior cicatrix is separate, even distant from the impression above it, but in the *ovatus* these scars are broadly confluent. Another distinctive mark is the anterior end of the cardinal line, which suddenly becomes much contracted over the cicatrix and is toothed finely nearly to the cardinal extremity. In all the specimens of *ovatus* that I have seen the cavity of the umbo is deeply tinged with dark green over a wide space, but in the allied species this part of the interior is pure rosaceous, and the only green is a bright spot under the anterior hinge margin, a dull larger stain beneath it, and another small stain near the posterior ventral margin.

PALÆONTOLOGICAL MISCELLANIES.

* BY T. A. CONRAD.

Note on a Cretaceous limestone of Dakota.

The Academy has received specimens of a black limestone from Dakota, near Great Bend of the Missouri, where they were found by Dr. Glatfelder. The surfaces of these fragments are exceedingly irregular, and they are also full of cracks or seams caused by the shells of *Inocerami*, and in some instances they are almost composed of fragments of *Inocerami*, exhibiting their peculiar fibrous structure.

These shells are of two species, the *I. Sagensis*, of Owen, and a smaller nearly smooth species, both in fragments. The rock contains also entire specimens of a small *Ostrea*, and of a *Lingula*, both shells having their valves united as when living. But what is most remarkable of the Cretaceous rock of this age in Dakota is the vast abundance of fragmentary *Inocerami*, proving that shells of this genus must have in one stage of the Cretaceous era actually paved the ocean bed.

The fragments of these shells are of various sizes, and have evidently been broken by agitation of the waters and attrition, which have probably not been long continued, as the shell when preserved, does not appear to be water worn, and the angles of fracture are sharp. Dr. Leidy has a piece of English flint, on the surface of which he pointed out similar fragments of an *Inoceramus* imbedded in the centre of the mass.

The most abundant determinable fragments of *Inoceramus*, a few of which show a large portion of the shell and mould, appear to belong to *I. Sagensis*, Owen, to which species I think should be united *I. Nebraskaensis*, Owen, the only differences appearing to be owing to age and pressure. Both shells show on the mould or cast, numerous radiating wrinkles. The agency of pressure, in varying the form of a single species, is exhibited in *I. problematicus*, a very abundant western species.

2. *Note on* *ATURIA* *MATHEWSONI*, *Gabb.*

This Cretaceous fossil of California is, I think, a member of the Cretaceous genus *Hercoglossa*, Conrad. In all the species of *Aturia* the septa are much more numerous than in *Hercoglossa*, and unlike the septa of the latter, the angles of the lobes are nearly in contact, and in the anterior portion of the shell overlap each other, whilst in the latter genus these angles are distant. I have no doubt therefore that the siphuncle of Mr. Gabb's species will be found to be tubular as in *Hercoglossa*, and not funnel-shaped as in *Aturia*.

3. *On* *CORBICULA DENSATA*, *Conrad.*

Prime, in his monograph of *Corbiculadæ*,* remarks that all the American species have a short sinus in the pallear line, whilst in the exotic species this line is entire. In the only Miocene species known in North America, the pallear line is entire, and the shell belongs to the genus *Corbicula*, a genus unknown to the present fauna of North America. In this exotic character the fossil species accords with the present geographical distribution of certain genera of the American Miocene, as *Crassatella*, *Clementia*, *Bucardia*, *Isognomen* and *Glycimeris*, none of which genera are known to be in the recent fauna of America.

4. *Description of a new genus of* *PECTINIDÆ*.*LYROPECTEN*, Conrad.

Description.—Inequivalved; both valves convex; ears unequal; ribs large; ribs and intervening spaces striated; hinge with irregular oblique teeth on each side of the fosset; both valves with a hump or wave on the umbo.

L. crassicardo, Conrad, (fossil,) California.—Proceed. Acad. Nat. Sciences, 1862, p. 291.

Observations.—This genus made its first appearance in the California Miocene. It is very different from the genus *Pallium*, Klein, which is founded on *Pecten pallium*. The valves of that species are regularly convex, and the hinge is without those irregular teeth which characterize *Lyropecten*. Although I have not seen hollow tubercles on the ribs of the fossil species, as in *Pecten nodosus*, Lin., the latter is a species of *Lyropecten*, together with *P. fragosus*, *P. subnodosus*, *P. intermedius*, *P. magnificus*, and *P. noduliferus*, Sowerby.

* Smithsonian Miscellaneous Collections, 8vo. 1865.

There is no recent or fossil species of *Pallium* in America, the type of that genus living on the shores of the Mauritius and Phillippine Islands. The genus *Dentopecten*, Rüppell, founded on *P. plica*, Lin., is not the genus *Pallium*, Klein, as Shumacher regards it, but of Martini.

Lyropecten is exclusively American, living within the tropics, and found in a fossil state in California only; much farther north than the localities of the recent species.

LYROPECTEN INTERMEDIUS, Conrad.

Description.—Rounded-oval, ventricose; ribs 9—10 nodose, as wide as the interstices; with numerous closely scaled striæ covering the whole surface, and numbering about ten between each rib. Purple, within purple, with a large white central deposit of callus.

Length $4\frac{3}{4}$, breadth $4\frac{3}{4}$ inches.

Locality.—Cape St. Lucas, California.

Cabinet of the Academy of Natural Sciences.

Observations.—This shell, of which a single, somewhat worn valve is in our collection, was received by the Academy from the Smithsonian Institution of Washington, with the following label attached:

“*Pecten subnodosus*, var. *intermedius*.” It differs from *subnodosus*, however, in having much finer striæ, numbering nearly double as many between each rib.

DESCRIPTIONS OF NEW GENERA AND SPECIES OF FOSSIL SHELLS.

BY T. A. CONRAD.

ANOMIIDÆ.

PARANOMIA, Conrad.

Description.—Irregular, inequivalve, one valve flattened or slightly concave; hinge of lower valve with a broad irregular triangular tooth or plate, flattened or slightly convex, with sharp margins and an anterior compressed small but prominent tooth; muscular impression situated towards the ventral margin in a line with the apex or nearly equidistant from the anterior and posterior ends.

Type *Placunanomia Saffordi*, Conrad.—Journ. Acad. Nat. Sciences, Vol. IV., p. 290, pl. 46, fig. 21.

This Cretaceous genus somewhat resembles *Plicatula*, but it is probably more nearly allied to *Placuna*. It does not appear to have a foramen, as I supposed, but the shell is very thin about the umbo, and frequently appears from within as if there were a large opening, but this is owing to the disintegration of the shell. It is probable that the young shell had a foramen, which it lost in a later stage of growth, like *Carolia*. It is often attached by the umbo to other shells. The genus is very distinct from *Placunanomia*.

Two other species are known in the Ripley Group, to which this genus appears to be limited, viz., *P. lineata*, Conrad, and *P. (Placuna) scabra*, Morton.

NUCULANIDÆ.

YOLDIA, Mörch.

Y. ALBARIA, Conrad, (*Y. protexta*, Con.)—Amer. Jour. of Conch., Vol. I., p. 213, pl. 21, fig. 2.

This shell coming into the same genus with *Leda protexta*, Gabb, it is necessary to change the name.

ARCIDÆ.

TRIGONARCA, Conrad.

Description.—Trigonal, ventricose, hinge similar to that of *Axinea*, a very oblique acute carina margins the posterior cica-trix, and extends, though less prominent, to the apex.

A very perfect valve of *Arca Eufalensis*, Gabb, from Haddonfield, N. J., shows the generic characters of this genus much more clearly than the specimen on which the genus was founded. It evidently connects the genera *Axinea*, *Arca* and *Cucullæa* more intimately than the existing genera of *Arcidæ*. This small bivalve therefore proves to be generically related to *Trigonoarca Maconensis*, Conrad, figured in outline in the Journal of the Academy of Natural Sciences, Vol. IV., 2d series, pl. 47, fig. 20.

Type *Trigonoarca Maconensis*, Conrad.

TELLINIDÆ.

CYPRIMERIA, Conrad.

CYPRIMERIA CRETACENSIS, Conrad. (*Sanguinolaria*).—Journ. Acad. Nat. Sciences, Vol. IV., 2d series, p. 277, pl. 46, fig. 11.

Dosinia Haddonfieldensis, Lea.—Proceed. Acad. Nat. Sciences, 1861, p. 150.

AVICULIDÆ.

PULVINITES, DeFrance.

P. ARGENTEA, Conrad.

Description.—Lower valve flattened or bent outward, substance thin, laminated and nacreous; hinge with a broad plate, which is terminal and furnished with transverse prominent teeth, flat on their summits; the series placed in a rectilinear line, but the teeth decreasing in size in consequence of the slope of the dorsal margin; valve perforated in the umbo, from the upper margin of which opening is a triangular groove running to the apex; muscular impressions two, one above the other; the upper one not exactly under the foramen, but a little to the right of a line from the apex to the ventral margin.

Pulvinites argentea, Conrad.—Journ. Acad. Nat. Sciences, 2d series, Vol. IV., p. 298, pl. 46, fig. 51.

This interesting bivalve is nearly related to *Isognomen*, Klein, (*Perna*, Lam.), and with which when very young it might be confounded, because in an early stage of growth it has, like that

genus, a marginal gape or opening for the byssus, which is finally closed, but leaves a conspicuous scar from the extremity of the hinge margin to the foramen, as represented in the figure. The exterior of the valves shows no trace of this scar, but it is well marked within and terminates in a rounded foramen.

UNIONIDÆ.

PRISCONAIA, Conrad.

Description.—Equivalue, ovate; hinge in left valve with two cardinal teeth, the anterior one compressed, angular, oblique, with an anterior pit; posterior tooth broad, smooth, convex, triangular, situated under the beak, emarginate at base and directed towards the posterior extremity; no lateral teeth; muscular impressions situated near the cardinal line; pallial line entire.

The specimen of this shell consists of one left valve, which is thin and converted into iron pyrites. It bears the same generic relation to *Carbonicola*, M'Coy, that *Margaritana* bears to *Unio*, and it existed in the same period with *Carbonicola*, the Carboniferous. It can be distinguished externally from the latter genus by its comparatively short ovate outline.



PRISCONAIA VENTRICOSA, Conrad.

Description.—Ovate; umbo broad, inflated, with a prominent summit; posterior hinge margin very oblique, posterior margin obliquely truncated, extremity obtusely angular, anterior margin obtusely rounded, beaks smooth and entire, distant from the anterior end.

Gresslya ventricosa? Agassiz.

Locality.—Little Stranger Creek, ten miles from Fort Leavenworth, Kansas.

Observations.—This fossil was found by Henry Lamborne in an ash-colored shale. The hinge is in a perfect state of preservation, and the valve became easily detached from the cast. It is named from its supposed identity with *Gresslya ventricosa*, of

Agassiz, who was unacquainted with the hinge character and in doubt of its stratigraphical position.

There seems to be no doubt that fresh water testacea existed as early as the Carboniferous era, shells resembling Unionidæ occurring with univalves closely resembling the genera *Limnea* and *Physa*. M'Coy has constructed the genus *Carbonicola* for the Carboniferous *Unios* of Sowerby, and the present genus bears a similar relation to the recent genus *Margaritana*, being without lateral teeth. This family is found in the Wealden, but the generic characters of the specimens seem to be undetermined. The cast figured by d'Orbigny as a Cretaceous *Unio* is too obscure to rely upon, but the Eocene *Unio Edwardsi* has unmistakably the hinge character of recent Unionidæ, either belonging to *Unio* or to a genus very closely allied to it. Meek and Hayden have also described a few Eocene *Unionidæ*, of the Western Territories. In the Miocene period, for the first time in Palæontological annals, the family group of the *Unio* type was diversified by various species of great variety of form and sculpture similar to those now existing in the Mississippi and its tributaries. This fresh water group existed in the Miocene of Europe, whilst in the extended North American Miocene of the Atlantic slope we have not yet found a single specimen of Unionidæ. This is remarkable, for where we find a species of *Vivipara*, a *Rangia* and *Cyrena*, we would expect to find an occasional example of the Unionidæ.

In the Eocene of the Paris basin Deshayes finds two species of *Anodonta* and three of *Unio*, two species of which latter genus bear a general resemblance exteriorly to species of the tributaries of the Mississippi, but they are very distinct as species from any existing shells. The similarity of the Unionidæ of the European Miocene to the existing group of the United States is accounted for from the fact that the fauna of that period is represented by the existing fauna of North America.

CRASSATELLIDÆ.

PALÆOCARDITA, Conrad.

Type *Cardita Austriaca*.

I have stated in a former number of this Journal my belief that the genus *Venericardia*, Lam., originated in the Eocene period. The same may be said of *Cardita*, Brug. Stoppani has described and figured a number of shells which he refers to *Cardita*, found in a bed which he terms *infralias*. The first of these, *C. aspera*, has more the habit of a *Cardium* than *Cardita*, but as the hinge is neither figured or described, its generic characters remain uncertain. The next species, *C. Austriaca*, appears

to be nearly related to the *Carditamerce*, but the hinge character is not very clearly represented. It is sufficient, however, to show a decidedly new generic form, as it wants the long, slender posterior cardinal tooth of *Carditamera*, Conrad, (*Lazaria*, Gray,) and the anterior cardinal tooth of the right valve is represented as thick and tuberculiform, whilst in the latter genus there is no distinct tooth but only a small fosset. The other shells referred to *Cardita* are probably all congeneric with *C. Austriaca*. See Stoppani's Palæont. Lomb. Monog. des Foss. De L'Azzarola, p. 53—7.

PLEUROMERIS, Conrad.

Description.—Equivalve, triangular, radiately ribbed; hinge in the right valve with one broad, nearly direct concave or broadly furrowed recurved tooth, the upper extremity acute and opposite or above the apex of the shell; hinge in the left valve with three teeth, the anterior one small and fitting into a cavity in the opposite valve.

PLEUROMERIS DECEMCOSTATA, Conrad.

Description.—Triangular; ribs twelve, rounded ornamented by numerous angular or transverse tubercles over all the ribs.

Cardita tridentata, Conrad, (not Say.)—Tertiary Foss. of the U. S., p. 76, pl. 43, fig. 11.

Observations.—This shell is nearly related to Say's *tridentata*, but has only twelve ribs, whilst Say's species has eighteen, and the elevated concentric lines are said to be obsolete on the anterior side, but in our fossil the tubercles or lines are most prominent on the anterior side.

I have not seen a specimen of Say's species, and therefore cannot say whether it should be referred to this genus.

The shell described and figured by Reeve in *Conchologia Iconica* as *Cardita tridentata*, Say, is a far larger and different species from the *tridentata*.

ASTARTIDÆ.

ASTARTE, Sowerby.

ASTARTE CORBICULA, Conrad.

Description.—Subtriangular; posterior margin truncated, direct, ribs fifteen, prominent, concentric, imbricated, the interstices transversely striated; beaks distant from the anterior end; lunule cordate, impressed; inner margin crenulated. Length quarter of an inch.

A. crenulirata, Lea, (not Conrad.)—Proceed. Acad. Nat. Sciences, 1861, p. 150.

Locality.—Haddonfield, N. J.

LUCINIDÆ.

LUCINA, Lam.

L. DENSATA, Conrad.

L. Pennsylvanica, Tuomey and Holmes, (*not Lam.*)—Pliocene Foss. of S. Carolina, p. 56, pl. 18, fig. 3.

This Miocene species is comparatively more elevated than *L. Pennsylvanica*. The posterior margin is nearly direct, and obtusely rounded or abrupt; the sinus has a greater downward slope, and the dorsal margins are much more oblique than in the recent *L. Pennsylvanica*.

CARDIIDÆ.

CARDIUM, Lin.

C. (TRACHYCARDIUM) EMMONSII, Conrad.

C. muricatum, Emmons, (*not Lin.*)—Geol. of North Carolina, p. 301, fig. 233.

This shell is shorter or comparatively more elevated than *C. muricatum*, with a thicker cardinal plate. In the figure the ribs are also flatter on the back and furnished with broad scales, not small tubercles as in *C. muricatum*.

C. (TRACHYCARDIUM) CAROLINENSIS, Conrad.

Cardium muricatum, Tuomey and Holmes, (*not Lin.*)—Pliocene Foss. of South Carolina, p. 64, pl. 19, fig. 2.

This species differs from *C. muricatum* in being less oblique, and in being subequilateral, whilst the anterior margin is not obliquely rounded, and the posterior ventral margin is almost regularly rounded with the posterior margin; the posterior extremity being undefined in consequence of a very slight truncature, whilst in *C. muricatum* this part is more abruptly rounded, which gives a much longer proportional line to the umbonal slope; there are also fewer ribs in the present species and a much deeper serration to the anterior margin of the valves. It is a smaller species than *C. muricatum*.

VENERIDÆ.

MERCENARIA, Schum.

M. PERCRASSA, Conrad.

Description.—Cordate, profoundly ventricose and thick in substance; humped or subangular below the umbo, radiato-plicate; disk rough with prominent waved lines of growth; posterior margin obliquely truncated, posterior area depressed, with a longi-

tudinal furrow; cardinal plate profoundly dilated, rugoso-plicate; inner margin finely crenulated.

Locality.—Virginia. J. A. Marks.

Observations.—This is the thickest and most ponderous bivalve of its size which has yet been found in America. Though its length is only four and three-fourths, its diameter is four and one-fourth inches. The hinge is correspondingly strong, the teeth thick and the intervening pits very profound; the nympha in the right valve very prominent and profoundly tuberculato-rugose, which fits into a cavity of the opposite valve behind the prominent part of the nympha.

Allied to *M. tridacnoïdes*, Lam., from which its hinge, thickness, and much finer marginal crenulations readily distinguish it. Its external radiating grooves are narrower and more angular than those of the former species.

CYTHERIOPSIS, Conrad.

The figure of *Grateloupia irregularis* in Höernes' Foss. Mollusk. des Wiener Beckens, pl. 16, fig. 5, shows a palleal impression of the same character as that of *G. donaciformis*, Desmoulins; joining the posterior cicatrix at its lower margin it runs towards the ventral margin of the shell a short distance, and then suddenly curves upwards and forms a wide sinus, the anterior extremity of which is much beyond the middle of the valves. This character forms a marked contrast to the form of the palleal line in *Cytheriopsis*, which joins the anterior extremity of the cicatrix, and has a short rounded or subangular sinus.

SCROBICULARIIDÆ.

SEMELE, Schum.

S. CAROLINENSIS, Conrad.

Description.—Suborbicular, inequilateral; length and height nearly or quite equal.

Amphidesma orbiculata, Tuomey and Holmes, (not Say).—Pliocene Foss. of S. Carolina, pl. 23, fig. 4.

Observations.—This shell has a thicker and broader cardinal plate than the *orbiculata*, and may be distinguished from it by its outline, the latter species being considerably longer in proportion to the height.

ABRA, Leach.

A. NUCULIFORMIS, Conrad.

Description.—Subtriangular; very inequilateral; anterior side somewhat produced, acutely rounded at the extremity.

Amphidesma æqualis, Say, Tuomey and Holmes.—Pliocene Foss. of S. Carolina, p. 93, pl. 23, fig. 3.

Observations.—This Miocene fossil has hitherto been considered identical with Say's *æqualis*, but it differs in attaining a larger size, and more especially in having a much wider cartilage fosset and more elongated or produced anterior side.

ANATINIDÆ.

LEPTOMYA, Conrad.

Description.—Elongated, inequivalve, thin, perlaceous, gaping anteriorly; hinge with a projecting spoon-shaped cartilage process, narrowing gradually towards the inferior end, which is acutely rounded; this process joins an oblique callosity which extends to the cardinal margin; an obsolete rib and fissure run obliquely from the anterior side of the apex.

Periploma applicata, Conrad.—Journ. Acad. Nat. Sciences, Vol. IV., 2d series, p. 276, pl. 46, fig. 1.

This genus, which is allied to *Anatina*, differs from it in having a tapering cartilage process attached to a rib or support which joins the hinge margin anteriorly; and in having the fissure anterior to the apex, and running obliquely towards the anterior extremity of the ventral margin.

This genus is known in this country only by one species, which is found in the Ripley Group of the Cretaceous era. Judging from external characters and outline of the shells, I should suppose that d'Orbigny's *Periploma Robinaldina*, *P. Necomiensis* and *P. simplex* are species of *Leptomya*, which genus probably became extinct with the Cretaceous fauna.

The gape of the anterior is moderate, and valves but slightly reflexed, in which respects it differs essentially from *Anatina*.

SOLENIIDÆ.

LEPTOSOLEN, Conrad.

Description.—Elongated, thin in substance, straight with the dorsal and ventral margins parallel; plicated anteriorly; open at both ends; beaks not nearly terminal; hinge of the right valve with one direct tooth, convex anteriorly, truncated behind; an internal rounded direct rib commences under the cardinal margin, gradually becomes less prominent and disappears towards the ventral margin.

Siliquaria buplicata, Conrad.—Journ. Acad. Nat. Sciences, 2d series, Vol. III., p. 324, pl. 34, fig. 17.

Observations.—Having worked out of the marl the interior of this beautiful Cretaceous bivalve, I find it differs essentially from the genus *Solena* of Brown, or *Siliquaria*, Schumacker, neither of which genera I believe existed before the Miocene period.

The shell upon which this genus has been founded was discovered in North Mississippi, in an ash-colored marl, which also occurs at Eufala, Alabama, and near Haddonfield in New Jersey, in all which remote localities the marl preserves the identical mineralogical and zoological characters, showing that it was once a continuous ocean bed from New Jersey to the Mississippi below Memphis, Tennessee.

ON THE ERRORS OF TOO EXCLUSIVE CLASSIFICATIONS.

BY H. CROSSE.

Translated from the "Journal de Conchyliologie," VI, No. 3, July, 1866.

BY FRANK DAULTE.

Ancient authors have proposed for those inferior animals, actually known as *Mollusks*, systems of classification, which had the fault of being founded on characters too exclusively conchological. Beside, it could scarcely be otherwise at a time when the study of these animals was so incomplete, that it did not always permit, in separating or uniting them, a reliance on the specific characters of their internal organization. This has been the origin of many errors, corrected since, and under whose influence, taking for a base similarities more apparent than real, animals which nature had separated from each other by important organic modifications had been methodically put together. Thus, for example, the *Janthina* has been confounded with the *Helices*, and *Halio Priamus* has successively been considered as a *Buccinum*, *Bulla*, *Helix*, and *Achatina*, before taking definitively the place ascribed to it in classification by the organization of its Mollusk as it is actually known.*

The same reproach could not assuredly be made, without injustice against the most part of modern naturalists, as to ancient authors, for the former seem to have systematically neglected characters drawn from the intimate conformation and structure of the shell, thus forgetting that they fall from one excess into another, and that in so acting they deprive themselves voluntarily of precious information and important characters.

We shall indicate two groups of naturalists, or, more correctly, two schools who, we think, follow this system with a certain degree of exaggeration.

The first, which we shall designate under the name of *School*

* The anatomy of *Halio Priamus* was published for the first time in the "Journal de Conchyliologie," Vol. VII, p. 158, pl. V.

of mere anatomy, almost considers the shell of Mollusks as if it did not exist, at least scientifically. It sees nothing and will see nothing beyond anatomical characters, forgetting that these characters, which in minute animals are often difficult to observe, do not always present a degree of sufficient certainty, and that in microscopic observation there is often more of imagination than would be supposed at first sight.

In proof of our assertion, we shall state some of the differences between anatomists, concerning certain minute portions of the inner organization of Mollusks, and the numerous errors which have been made on this point, not only by naturalists of ordinary talent, but even by eminent scientific men.

We shall not now proceed with severity against this school, whose deep studies we admire, and whose discoveries we appreciate when they are genuine, but whose exclusive and rather narrow minded spirit we reprove.

We shall only quote, as an example of the exaggerations to which in matters of classification preoccupations too exclusively anatomical lead, the introduction of the *Dentalium* into the acephalous mollusca, proposed a few years since by Mr. Lacaze Duthiers, disregarding the rudimentary head of these animals, their lingual dentition, their embryology and their shell, perfectly univalve, which is, after all, but the exaggeration of the typical form of *Patella* and *Fissurella*.

Naturalists of the second school have devoted their attention, to make it the base of a system of classification, to the thorough study of the differences presented by certain parts in the organization of Mollusks but little known before their researches, and generally considered by their predecessors as secondary and of little scientific value. Thus, for example, Dr. Pfeiffer has made a very ingenious use of the differential characters of the opercula to establish divisions in the operculated terrestrial Pulmonifera, which he designates *Pneumonopoma*. It is thus again that Mr. Lovén, after elaborate researches on the lingual dentition of Mollusks, a subject but very little known before his time, thought himself justified in adopting, as a basis for the classification of Gasteropods, solely the modifications presented by this portion of their organization. After him, Mr. Troschel advanced yet further in this path. In a very interesting work, as far as the number and novelty of scientific documents which it contains is concerned,* he made known the lingual dentition of a considerable number of Gasteropod Mollusks, and has taken his observations as a starting point for establishing a certain number of new divisions. Among the naturalists who, in their works,

* On "The Jaw of Mollusks."

have given to differential characters drawn from the buccal and lingual dentition of Mollusks an important systematic value, we shall name further, in England, Dr. Gray, in America, Mr. Morse, and, finally, in Denmark, our learned colleague Mr. Mörch, who has recently published in our Journal* an important article on this subject.

Although we do not dispute the great learning of our honorable collaborator, yet we do not entirely agree with him concerning the systematic value that should be given to the lingual and buccal dentition of *Mollusks* in their classification. He believes this character to be of primary value, and that, consequently, the value of teeth in Mollusks must be considered as equal, or nearly, to that of corresponding parts in Mammalia.

We are far from advocating this opinion, and we beg to show in a few words the reasons which, we think, speak against it.

In Mammalia, the differential characters drawn from the teeth generally correspond to other important modifications, of the bones, digestive system, the manner in which the members are terminated,—in one word, with one or several other important parts of the organism.

It is for this reason that they are considered, and with reason, as distinctive characters of the first order.

Is it the same as to Mollusks? We think not, and if we must prove it, the proofs will not fail. Let the lingual dentition of a certain number of Mollusks belonging to different genera, however related to each other, be comparatively examined, and it will almost invariably be seen that, in the intimate constitution of these teeth, there are considerable differences, and not at all according with the slight difference of the other zoological characters. As Mr. Mörch himself acknowledges, “the *Aeolis* and the *Voluta* have but one row of teeth, while the genera nearest approaching the first of them have numerous rows, and those nearest to the second three rows.” Some genera, (*Thetys*, *Stilifer*, *Leptoconchus*, for example,) have no teeth, while the nearest forms have them.

This last fact is more striking still in the family of the *Doridopsidae* and genus *Doridopsis*, recently created by Messrs. Alder and Hancock.†

The Mollusks of this family are so similar to the genuine *Doris* in their principal characters, that several of them have been described as such without hesitation by authors. (*Doris tuberculosa*, Quoy and Gaimard, and *D. nigra*, Stimpson, for example.)

* “Journal de Conchyliologie,” 1865.

† Notice of a Coll. of Nudibranchiate Mollusca made in India, &c. Trans. of the Zool. Soc. of London, 1864.

Their exterior form, coloration, system of ornamentation, the position of their branchiæ, contribute to ally them with the *Doris*. They are scarcely distinguishable externally by the smallness of the head and mouth, and by a certain difference in the position of the latter. However, they show no sign of lingual dentition, jaw, nor spinose collar, and their mouth, designed to act merely by suction, possesses a retractible proboscis. It is well known that such is not the case with the real *Doris*. In following to the letter the system upheld by Mr. Mörch, it would be necessary, for this single difference in the lingual dentition, to put very far apart and in different orders these Mollusks, which are scarcely generically distinct in all other particulars. Such a result, we think, cannot be appropriately considered as the evidence of a natural system.

We may add that the lingual dentition varies considerably in Gasteropodous Mollusks, not only from genus to genus, but still more from species to species. The *radula* of the *Cypræa*, of the section *Trivia*, (*C. coccinella*, for example,) resembles much more that of the *Erato* and even *Pedicularia* than that of the *Cypræa* of the other sections, which, however, are near relatives.* Still more, the lingual dentition does not always present characters constantly identical in the same specific type. Thus Mr. Troschel† has given the figure of two median plates, belonging to two individuals of the same species, the *Natica adspersa*, Menke, and presenting between them marked differences. The same takes place in the lingual dentition or jaw.

Mr. Binney‡ has recently figured nine jaws, all from adult specimens of an American species, *Helix Tryoni*, Newcomb, and in which the number, the dimensions and the relative position of the ribs of the anterior surface present such dissimilarities, that each of them seems to belong to a distinct species.

Finally, while genera, conchologically and zoologically neighbors, sometimes possess a great variety in their lingual dentition, on the other hand, generic forms, distant from each other, present between themselves, singular analogies in the construction of their *radulae*. Thus we see a great similarity between the lingual dentition of the *Vermetus*, *Natica* and *Crucibulum*,§ although these genera are very distant from each other.

The median plate of the *radula* of the *Velutina* might almost be taken for that of the *Pedicularia*. These two genera could scarcely, however, be brought together.

What conclusion can we draw from all this, if not that the characters drawn from the lingual or buccal dentition of the

* Troschel, Das Gebiss der Schnecken, I. pl., XVI, XVII, and XVIII.

† Troschel, l. c. I, pl. XIV, p. 13 and 13a.

‡ American Journal of Conch., Vol. I, pl. VI.

§ Troschel, l. c. I, pl. XIII, fig. 1, 3, 4, 5, and pl. XIV, p. 13.

Mollusks are but secondary, and that it would be wrong to give them a value of first order in matters of classification?

We do not mean to say that the study of these characters is fruitless, and that it may not be called upon to render useful services to science. Far from that! We acknowledge that, thanks to this study, several families have been more clearly delineated whose affinities had remained obscure or had been misunderstood. To give but one example, we consider as satisfactory the division of the *Toxoglossata*, which has consecrated the re-union, so natural, in all respects, of the Cones and Pleurotomas. But, if we admit this union, it is because that, to the characters peculiar of the lingual dentition of the Mollusks which compose it, are added other conchological and zoological characters which confirm its value. The study of lingual and buccal dentition may yet be of great use to naturalists in doubtful specific cases, viz., when it becomes necessary to determine the real value of contested species. All this, we willingly admit. We only refuse to admit one thing, which is a system which would make of the lingual dentition a kind of infallible criterion, and take exclusively this character for a classification that would not take into consideration either the structure and the form of the shell, or of the other more important parts of the organization of the animal.

We have yet to speak about a few more assertions of Mr. Mörch. Concerning the Helicinæ, we persist in saying that they must be classed in the neighborhood of the Cyclostomæ rather than near the Neritinæ. The faculty that they possess of dissolving the internal partitions of their shells, a faculty possessed equally by the genera *Nerita*, *Neritina* and *Helicina*, and which Mr. Mörch gives as a reason for putting them in the same division, is far from being peculiar to these three genera. Not speaking of *Proserpina* and *Stoastoma*, the *Auricula* and even a few Helicidæ equally possess it. Among the marine species the genera *Comus* and *Cypræa* are endowed with the same faculty to a high degree. We even think that this faculty is common to all Mollusks; they make use of it in greater or less degree in the different genera, but that is all the difference, and in the same way that they make a synthesis by secreting the elements of their shell; they can also make the analysis, by dissolving more or less completely a part of the secreted test. This is then no sufficient reason, in our opinion, for placing the Helicinæ near the Neritinæ.

When Mr. Mörch says the Helicinæ are distinguished from the Cyclostomæ by the absence of a deep median furrow of the foot, he is right, if applied to the genus *Cyclostoma*, but he is wrong, if he means to include the *Cyelophorus* and a few other of the numerous genera which without doubt belong to the same

division and which are as completely as the Helicinæ deprived of a median furrow of the foot. Here again there is no reason for a separation.

As to the reasons for placing them together, on the other hand, they are numerous and evident. The Cyclostomacea and the Helicinacea are equally pulmoniferous, and have equally the eyes placed at the external base of the tentaculæ. These tentaculæ have exactly the same elongated and pointed form in the *Cyclophorus* and *Helicina*. The animals of these two groups have the same habits, the same way of living. Lastly, and for us it is conclusive, there exists a certain number of generic forms, placed, so to say, *a-straddle* of these groups, borrowing their characters of one and the other at the same time, and consequently uniting them, despite of all divisions, however ingenious they may be.

The curious genus *Bourciera*, placed by Mr. Pfeiffer among the Cyclostomacea, has an operculum with a distinctly spiral structure, a lingual dentition as in the Helicinæ* an heliciform shell, but it is without lustre, deprived of columellar callosity, and presenting, in the umbilical part, some resemblance with certain Cyclostomas. Of these three characters, the first makes of the *Bourciera* a Cyclostomacea, the second a Helicinacea, and the third an intermediate form, approaching more to the Helicinæ than to the *Cyclostomæ*.

The genus *Georissa*, recently† established by Mr. W. T. Blanford, comprises animals which, although they have a shell having the appearance and the characters of *Hydrocena*, differ by having a non-spiral operculum, excentrically striated, semi-oval, and approaching therefore much more to the Helicinacea than to the Cyclostomacea. Before Mr. Blanford had described this singular operculum, the species of this small Indian group were considered by Mr. Benson, who had described them, and by Mr. Pfeiffer, in the first Supplement to his "Monograph of the Pneumono-poma" to be *Hydrocena* (*H. pixis*, *H. illex* and *H. turrita*, Benson), and this for the simple reason that, from the appearance of the shell, it was impossible to distinguish them from the other species of that genus in any other way than specifically. The knowledge of the operculum has decided Mr. Pfeiffer, who, as it is well known, attaches a great deal of systematic importance to that character, to put the *Georissa* in another family in his second Supplement, but it has taken nothing from the conchological characters which make of this small genus a new proof of the intimate connection of the Helicinacea with the Cyclostomacea.

* Troschel, l. c., I, p. 246, pl. XX, fig. 14.

† W. T. Blanford, Ann. and Mag. Nat. Hist., 1864.

After such conclusive facts, we think it unnecessary to insist further on this point.

In the system of classification proposed by Mr. Mörch, for *Geophiles* or Terrestrial Mollusks provided with lungs and without operculæ, a system based exclusively on the form of the jaws, we see that the genera *Clausilia*, *Pupa* and *Cylindrella* (*Urocoptis*) are placed each in a different division, the first in the *Oxygnatha*, the second in the *Aulacognatha*, and the third in the *Agnatha*. This strange result we believe is of such a nature as to inspire legitimate doubts of the value of the system to any one who knows how very similar these three genera are, not only by the ensemble of their conchological characters, but still more by the general appearance and the manner of living of their Mollusks, conchologically speaking; their relations are so intimate that there are certain dubious forms, which have been bandied about by authors between the three genera, or at least between two of them. In a zoological point of view, the similarities between the animal of the *Pupa* and that of the *Clausilia* are numerous, and as for their way of living, in both genera are found rock species (having usually a whitish shell) who brave the heat of the sun, and species with almost subterranean habits. Concerning the organization of the *Cylindrella*, information is very scarce; nevertheless, the animal of the species figured by Guilding and Swainson is small, short, and looks very much like that of the *Clausilia*. The absence of jaw should need to be confirmed by researches made with care. As for the similarity of the lingual dentition that Mr. A. Schmidt believed he perceived in the *Cylindrella* and the *Testacella*, it is more apparent than real, at least as far as we can judge by the little personal observations that we have been able to make. Thanks to an obliging communication from Mr. Thomas Bland, we have been able to examine the lingual band of the *Cylindrella scæva*, Gundlach, of Cuba. The only similarity that we have found to exist with that of the *Testacella* consists in the oblique position of the lateral teeth, and it is that which probably caused Mr. Schmidt to commit an error.

But as to the structure of these teeth themselves, it is totally different, and does not at all resemble the spinulæ, so characteristic of the *Testacelle*.*

* These teeth resemble much more those of the *Limax*, *Ariolimax*, *Anadenus*, &c., although, however, this resemblance is not identical. The central formula of the *Cylindrella scæva* is 13.1.13. The central tooth is straight, small, and furnished with a very prominent median point. The lateral teeth are placed obliquely, large, bicuspid, and with a square base. Both points are not placed on the same plane. The five last teeth diminish as to their volume, and their two points become less and less apparent, but their general form remains always the same.

As for the manner of living it is the same for the *Cylindrella* as for the *Pupa* and *Clausilia*, there is no uniformity. If the large species of Mexico take pleasure in burying themselves under dead leaves and lead a life almost subterranean, there are a great many others who live on rocks or on plants. Then it is not correct to generalize and to compare their mode of existence with that of the *Testacella* and the *Daudebardia*. Moreover the profusion with which certain species of *Cylindrella* are strewn in some localities, seems to exclude the probability of carnivorous habits. For, and this is a remark which seems to apply to inferior beings as well as to those of a superior organization, the animals of prey generally live alone or disseminated in small groups, while herbivorous animals have a marked tendency to live *in company* and to form large flocks.

There is yet another serious objection that we find in the system of classification of the pulmonate Mollusks based on the similarities, and of differences of the lingual and buccal dentition, apart from conchological characters.

Although this system might be completely founded—which is not yet proved, we think,—it would still be wrong, in a practical point of view, in the actual state of our knowledge, and for this reason. This method of classification unites forms completely dissimilar, conchologically speaking, and separates genera generally considered as neighbors, very loudly proclaiming the little systematic value of the shell. Now, of the nine or ten thousand living or fossil Pulmonifera actually described, of how many species is the anatomy and the lingual and buccal dentition, more or less perfectly known? Not of two hundred assuredly.

But, let us even admit this number, which represents about 1-50 of the known Pulmonifera. By what right according to that system, could the other 49-50, viz., almost the whole, be allowed to be classed, having nothing else to be guided as to them but the mere analogy of the conchological characters, characters that the followers of the said system seem to suspect, and reject almost entirely? What would, for example, happen, whenever the systematic position of a new and small turriculated Pulmonate, whose animal is not known, had to be determined, and by what reason should it be placed among the Pupæ, rather than among the *Cylindrellæ*, or the *Clausiliæ*, since it would be admitted that the characters drawn from the shell are without value? It would lead, in the alternative, either to an inconsistency in admitting characters theoretically not admitted, or to consider as not existing, scientifically the almost totality of known species.

To resume, the system proposed for the Pulmonates, as well as the one which applies to the rest of the Gasteropods, is, we think, erroneous :

1. Because it has the inconveniency of placing in different families Mollusks allied by the shape of their shells, their principal organs, their way of living, and all this to take for a basis characters comparatively of little importance in the organism taken as a whole.

2. Because, even if we could admit theoretically, in classification, the characters drawn from the lingual and buccal dentition of the Mollusks, this manner of proceeding would be impracticable on a large scale in the present state of our knowledge of the science. And, indeed, it would be absolutely necessary to propose a classification of that kind, reposing on a sufficiently secure basis, to know first the buccal and lingual organization of almost all the actual catalogued species, and not merely that of an imperceptible minority, which renders every kind of serious generalization impossible, or compels us to introduce hypotheses in a science of observations.

As for paleontology and fossil Mollusks, it is worse still, for there we find ourselves before a radical and perpetual impossibility, seeing that of these species the shell only is or ever will be known ; in such conditions the shell is then necessarily the only possible base of any classification.

Our conclusion is that, although nothing must be neglected in matters of science, and that it is wise to make use of the new documents which every day brings forth, it is dangerous to be too exclusive, and to be obstinate enough to look at but one face of science.. The studies of the great anatomists have served to reveal the intimate organization of Mollusks, and have given us the means to delineate surely this important division of the animal kingdom. The thorough study of the lingual and buccal dentition is a recent conquest of science, whose value must be acknowledged, and of which it is wise to make use in a reasonable measure. But, is it a reason for discarding the previous characters which is furnished, for the classification of Mollusks by the study of the shell, considered in its complete structure, as well as in its general appearance ? We think not, and we believe that the serious and simultaneous study of these three kinds of characters is not too much on which to base the foundation of a good classification of the Mollusca, for a classification can only be recognised as such if it reposes, not only on one or two characters arbitrarily chosen, but on the organization of the animals taken as a whole.

OBSERVATIONS ON THE BATHYMETRICAL AND GEO-
GRAPHICAL DISTRIBUTION OF MARINE INVERTE-
BRATE ANIMALS.

BY J. GWYN JEFFREYS.

(From "Report on Dredging among the Hebrides," published in the
Annals and Magazine of Natural History, Nov., 1865.)

Some of our most conspicuous and prized shells, that are also of a northern type, are wanting in the Hebrides. *Saxicava Norvegica*, *Natica Grœnlandica*, *Buccinum Humphreysianum*, *Buccinopsis Dalei*, *Fusus Norvegicus*, *F. Turtoni*, and *F. Berniciensis* are in this category. All the above (with the exception of *Buccinum Humphreysianum*, which inhabits Shetland and the coasts of county Cork) are met with on the Dogger bank; and the first two are fossil in the Clyde beds. Six out of the seven being univalves, I would venture to surmise that their non-existence in the western seas of Scotland may have arisen from the circumstance that the diffusion of univalves is slower than that of bivalves. The spawn of the former is attached to the spot where it is shed, or in a few cases (e. g. *Capulus* and *Calyptræa*) it is hatched within the shell of its sedentary parent; so that the fry forms a colony, and need not roam to any distance, provided their station yields a sufficient supply of food and has the other requisites of habitability. Not so with bivalves. These shed their ova into the water, or else (as in some of the *Kellia* family) hatch them within the folds of the mantle, whence they are excluded on arriving at maturity. Their fry swim freely and rapidly by means of numerous encircling cilia. The metamorphic state lasts many hours. During that period they can voluntarily traverse considerable distances, or they may be involuntarily transported by tidal and oceanic currents. Time is the only element necessary for their widest dispersion over the adjacent seas, if no barrier intervenes. Should, however, such an obstacle present itself, whether in the shape of previously existing dry land, like that which separates the North Sea from the Atlantic, or from an upheaval and drying-up of the neighboring

sea-bed by geological or cosmical causes, the further diffusion of any marine animals in that direction must necessarily be stopped. An opposite result would doubtless be produced by a sinking and submersion of dry land below the level of the sea, whereby the diffusion of such animals would be greatly facilitated. This appears to have been the fluctuating course of events since the formation of the Coralline Crag, which was probably the cradle or starting-point of our molluscan fauna—a period long antecedent to the last glacial epoch, and incalculably far beyond the advent of man, unless his origin is much more remote than it is at present supposed to be. I am not inclined to attribute the northern character of some of the Hebridean mollusca to the persistence of what have been called “boreal outliers.” The idea savors more of poetry than of philosophy or fact. The boreal or truly arctic species which once flourished in this district have become quite extinct, probably in consequence of one of those revolutions above suggested, by which the sea-bed was converted into dry land. These boreal species consist chiefly of *Rhynchonella psittacea*, *Pecten Islandicus*, *Astarte crebricostata* or *depressa*, *Tellina calcaria*, *Mya truncata*, var. *Uldevallensis*, *Trochus cinereus*, and *Astyris Holböllii*; and I have lately, as well as on a former occasion, dredged them on the coasts of Skye and West Ross, at depths of from 30 to 60 fathoms, or 180—360 feet. They had a semifossilized appearance. Not one of the above-named species has ever, to the best of my knowledge and belief, been found in a living or recent state in any part of the British seas. All of them occur in post-tertiary or quarternary deposits on the west coast of Scotland, from a few feet above high-water mark* to 320 feet above the present level of the sea.† The greatest subaërial height (320 feet) being added to the greatest submarine depth as above (360 feet), gives an extent of elevation and subsidence equal to 680 feet. But as *Pecten Islandicus*, for example, now inhabits the Arctic Ocean at depths varying from 5 to 150 fathoms, let us take the average of these depths, viz. $77\frac{1}{2}$ fathoms or 465 feet, and add it to the 680 feet. This would make 1145 feet, and probably represent the height at which the sea-level may be supposed to have stood when *P. Islandicus* lived on the highest fossiliferous spot noticed by Mr. Watson. The non-fossiliferous boulder-clay, indicating the simultaneous presence of arctic land which was also subject to glacial

* British Association Report, 1862, Trans. Sect. p. 73: Jeffreys, “On an Ancient Sea-bed and Beach near Fort William, Inverness-shire.”

† Transactions of the Royal Society of Edinburgh, 1864, p. 526: Rev. R. B. Watson, “On the Great Drift-beds with Shells in the South of Arran.”

conditions, is stated by Mr. Watson* to be about 800 feet higher than the marine deposit. The height of the layer of sea-shells on Moel Tryfaen in Carnarvonshire (evidently the remains of an ancient beach) exceeds that of the similar deposit at Cardigan by more than 1300 feet; and the difference of height observed in the case of other fossiliferous deposits in the north of England (e. g. Manchester and Kelsey Hill) shows that the disturbing movement has been unequal, and probably not synchronous, over the same area. It would seem that the extent of such oscillation has not altogether amounted to 2000 feet in the British Isles, taking Moel Tryfaen as the greatest height, and the Shetland sea-bed as the greatest depth at which quaternary shells of recent species occur. The Scotch and Irish deposits, however, are on the whole far more ancient than those of Wales and England, judging from their geographical nature; the former are chiefly arctic, and the latter merely northern. Whether other parts of the North Atlantic sea-bed have undergone a much greater change of level since the tertiary epoch is not so well established. Dr. G. C. Wallich, in his admirable and philosophical treatise,† with which all marine zoologists and geologists are, or ought to be, familiar, believed that certain starfishes which he had procured at a depth of 1260 fathoms (7560 feet) in lat. $59^{\circ} 27' N.$, long. $26^{\circ} 41' W.$, about halfway between Cape Farewell and the north-west coast of Ireland, were originally a shallow-water species, but had gradually, and through a long course of generations, accommodated themselves to the abnormal conditions incident on the subsidence of the sea-bed.‡ The starfishes in question, which he refers to the *Ophiocoma granulata* of Forbes (*Asterias nigra* of O. F. Müller), appear, however, to belong to a different species, which inhabits deep water. In an important paper by Professor Sars, on the distribution of animal life in the depths of the sea,§ he states that *Ophiocoma nigra* (*O. granulata*, Forbes) is certainly found in shallow water, viz., from 2 to 30 fathoms, on the coast of Norway, but never at a greater depth so far as is yet known, and that it does not range north of the firth of Drontheim. He is of opinion that Dr. Wallich's species is *Ophiacantha spinulosa* of Müller and Troschel, a well-known and Greenlandic species, which is not littoral, but rather a deep-water kind, viz., from 20 to 190 fathoms; and he infers from Wallich's own account that the last-named species, instead of *Ophiocoma nigra* or *granulata*, was the one taken by the 'Bulldog' sounding in

* *Loc. cit.* p. 524.

† The North Atlantic Sea-bed, 1862.

‡ *Loc. cit.* p. 41.

§ Vid.-Se'sk. Forhandl. 1864: Hr. Sars. "Bemærkninger over det dyriske Livs Udbredning i Havets Dybder."

1260 fathoms. Dr. Wallich also adduces his discovery, at a depth of 682 fathoms (4092 feet), in lat. $63^{\circ} 31' N.$, long. $13^{\circ} 41' W.$, of two testaceous Annelids, which he assumed to belong to "known shallow-water forms," as further evidence of an extensive submergence of the North Atlantic sea-bed. These Annelids were named by him *Serpula vitrea* and *Spirorbis nautiloides*. But Professor Sars disputes their being shallow-water species. The former he identifies with his *Serpula polita* (= *Placostegus tridentatus*, Fabricius;) the latter is referred by Mörch* to the *Serpula spirorbis* of Linné. The one is regarded by Sars as a deep water and not littoral species, being found on the Norwegian coast in 20 to 300 fathoms; the other has a wide bathymetrical range, from low-water mark to 300 fathoms. I suspect, moreover, that there has been some mistake in the determination of the *Spirorbis*, and that it belongs to another species than that to which Wallich has assigned it. As to the accuracy of his statement that he procured living starfishes from a depth of 1260 fathoms, under the circumstances which he has described (viz., "convulsively embracing a portion of the sounding-line, which had been paid out in excess of the already ascertained depth, and rested for a sufficient period at the bottom to permit of their attaching themselves to it,") no reasonable doubt can be entertained. I have myself seen a number of *Antedon* (or *Comatula*) *celticus* clinging to the rope several feet from the dredge when it was taken up from about 60 fathoms. These starfishes must have crawled up the rope while the dredge was in motion or being hauled in, because no part of the rope had laid on the ground. Dr. Carpenter tells me that *Antedon rosaceus* has the same habit of crawling up and clasping a rope in shallow water.

The greatest depth marked on the Admiralty charts in any part of the Hebridean sea-bed which I examined is 132 fathoms. Here I got several kinds of living Foraminifera. Nineteen years ago I dredged near the same ground, in 116 fathoms, a fine cluster of one of the compound Tunicata, *Diazona Hebridica*, of a greenish-pink color. I do not mention this as a great or even considerable depth. Sars† and Koren‡ have done much more on the coasts of Norway; their dredging-explorations extended to 300 fathoms. In the paper from which I have extracted the above remarks as to the distribution of animal life in the depths of the sea, Professor Sars has enumerated no less than 52 species and distinct varieties of animals found by him at the depth of 300 fathoms. They may be thus classified:—Porifera (Sponges)

* Naturhist. Tidsskr. 1863: "Revisio critica Serpulidarum."

† Reise i Lofoten og Finmarken, 1849.

‡ Nyt. Mag. Naturw. 1856.

2; Rhizopoda (Foraminifera) 19; Polypi (Actinozoa) 7; Mollusca (Polyzoa 8, Tunicata 1, Mollusca proper 10) 19; and Vermes (Annelida) 5. He has also specified several Echinoderms, Cirripeds, and Crustacea, as inhabiting somewhat less depths, viz., from 200 to 250 fathoms. The observations of the learned Norwegian zoologist confirm those of Sir James Ross and Dr. Wallich, namely:—

1st. That the temperature of the sea is uniform ($39^{\circ}\cdot5$ Fahr.) over the whole globe, below a certain line which forms an isothermal curve, with but slight oscillations caused by changes of the atmosphere. This curve has its greatest depth at the Equator, but reaches the surface of the ocean in lat. $56^{\circ} 62'$, and dips again as it approaches the pole from this point.

2d. Although the pressure of the water is enormous at great depths, and in 300 fathoms is equal to about 56 atmospheres or 840 lbs. on the square inch,* yet the most brittle and delicate animals (such as Polyzoa and Polyps) inhabiting such depths do not appear to suffer the slightest injury. Their structure is porous and permeable by liquids, or accessible to an endosmotic influence by which the pressure is easily resisted.

3d. The want of light has always been considered an obstacle to the existence of animal life at great depth—not so much because light is directly essential to animal life, as on account of its indirectly contributing to its maintenance. It is generally supposed that animals are dependent on vegetable life. This latter, as is well known, cannot exist without light, under the influence of which the absorption of carbonic acid and the evolution of oxygen are effected. Light, however, exerts no such influence on animal life. Sea-weeds (the true Algæ) disappear in about 200 fathoms; and the only vegetable organisms which descend to a greater depth, say 400 fathoms, are Diatomaceæ. It may be observed, with respect to the action of light in producing color in animals, that although intensity of light may produce a corresponding intensity of color under ordinary circumstances, yet the diminution or absence of light in the sea is not necessarily followed by a diminution or absence of color in marine animals. Those taken from considerable depths have frequently vivid colors. The animal of *Lima excavata* (a comparatively gigantic species), from 300 fathoms, is of the same bright red color as those of *L. Loscombii* and *L. hians* from shallow water. It has been shown that red rays of light (*i. e.* actinic contradistinguished from luminous rays) penetrate deepest in the water.

* The Norse skaalpund is 10 per cent. more than the English lb. avoirdupois. Sixteen Norwegian square inches are equal to seventeen English square inches.

I will not here repeat what I have already published* on this interesting subject; but I may add that all the animals recorded as living at great depth are zoophagous, none of them phytophagous. The deep-sea dredgings of the Swedish Expedition to Spitzbergen in 1861 yielded some valuable results. Adjunct Professor Thorell and Professor Keferstein communicated some short and imperfect notices to the northern journals; but Professor Lovén has lately given us fuller information, which is published in the 'Transactions of Scandinavian Naturalists' at their ninth meeting held in 1863.† A Brooke's lead and a 'Bulldog' machine, with several improvements, were used on this occasion. Depths from 6000 to 8400 feet (1000–1409 fathoms‡) were thus explored. The sea-bottom at these depths was covered with a fine greasy-feeling material of a yellow-brownish or grey color, rich in Diatomaceæ§ and Polythalamia, and nearly devoid of sand. Professor Lovén was furnished with the notes of Messrs. Chydenius and Malmgren, made during the expedition, and with all the animals discovered in those great depths. The latter comprised:—Annelida, viz., species of *Spiochaetopterus* and *Cirratulus*; Crustacea, viz., a *Cuma* which appeared to be identical with *C. rubicunda*, Lilljeborg, and an *Apseudes*; Mollusca, viz., a *Cylichna*; Gephyrea, viz., a fragment of *Myriotrochus Rinki*. Steenstrup, and another allied form with large and fewer star-wheels, and of smaller wheels of the *Myriotrochus*-type; a species of *Sipunculus* resembling *S. margaritaceus*, Sars; and, lastly, a sponge, in which were found a Copepod or Ostracod, and a fragment of a *Cuma* resembling *C. nasica*. In the opinion of Lovén these animals indicate, so far as can be judged by so small a number, that in the abysses of the glacial seas there lives a fauna which does not greatly differ from that which lives on the same kind of bottom at much less depths. Proceeding upwards to the surface, from 50 or 60 fathoms the regions or zones have a greater variety of animals, even over the same kind of bottom. Taking this into consideration, and also recollecting that in the Antarctic seas, at measurable depths, there are forms of Mollusca and Crustacea which exhibit partly generic, partly almost specific identity with northern and hyperborean forms,

* British Conchology, vol. i. Intr. pp. xlviii–l, and vol. ii. Intr. pp. viii–xi.

† Stockholm, 1865: p. 384.

‡ The Swedish foot makes only 0·974 English foot. The Scandinavian fathom is 6 feet.

§ This does not quite agree with the accounts of Wallich and Sars, which give 400 fathoms as the limit of vegetable life; but it does not appear that the Diatomaceæ observed by Lovén had actually lived on the sea bottom. They might have been pelagic and floating kinds.

the idea occurs to him that, from 60 or 80 fathoms down to the greatest depth known to be inhabited by animals, the bottom is everywhere covered with a soft and fine mud or clay, and that there exists from pole to pole, in all latitudes, a deep-sea fauna of the same general character, many species of which have a very wide distribution. He also thinks it probable that in the vicinity of both poles such a uniform fauna approaches the surface; while in tropical seas it occupies the depths of the ocean, the coast-line there being represented by vast regions of distinct faunas, the circumferences or areas of which are much more limited. But, in the face of the discovery made by Professor Sars that large Brachiopoda, stony corals, and Polyzoa, as well as certain Mollusca (e. g. *Anomia* and *Saxicava*) which are peculiar to a hard or even to a rocky bottom, inhabit a depth of 300 fathoms, and seeing that Dr. Wallich found a living *Serpula* attached to a stone at the depth of 682 fathoms, I am not prepared to accept, without considerable qualification, Professor Lovén's notion that the sea-bottom from 60 or 80 fathoms downwards is everywhere formed of soft material; indeed we need not go far from home to seek a refutation of this idea. Captain Beechey's dredgings off the Mull of Galloway, in 145 fathoms (as reported by the late Mr. Thompson, of Belfast, in the 'Annals and Magazine of Natural History' for September 1842, p. 21), yielded live specimens of *Chiton fascicularis*, *C. cinereus*, *Trochus millegranus*, and *Trophon Barvicensis*, all of which are inhabitants of hard or stony, and never of soft ground, besides dead shells of the same and similar species. That is more than twice the average depth supposed by Professor Lovén to be the limit of hard ground.

DESCRIPTION OF A NEW SPECIES OF MONTACUTA.

BY JOHN H. THOMSON.

MONTACUTA GOULDI, Thomson. Plate 1, fig. 15.

Description.—Shell minute, diaphanous, rhomboidal inequilateral, not compressed. Beaks rather prominent, not in contact with an excavated areola in front. Basal margin nearly straight, ends obtusely rounded, forming a rhomboidal outline, regular lines of growth, with an opaque white thickened band surrounding the margin; hinge with the cartilage occupying a pit between two rather strong teeth.

Hab.—N. Bedford Harbor, in the interstices of a piece of timber dredged in sandy bottom.

Collection of Philadelphia Academy of Natural Sciences, and of Geo. W. Tryon, Jr.

This interesting shell I submitted to the late Dr. A. A. Gould but a few weeks previous to his death. He at once decided it to be a new species. As a slight tribute of respect for his great scientific attainments I dedicate it to his memory.

MONOGRAPH OF THE TERRESTRIAL MOLLUSCA OF THE
UNITED STATES.

BY GEORGE W. TRYON.

[Continued from p. 327, vol. ii.]

MESODONTINÆ.

Genera.

* *Shell minute, margin of lip circular, its extremities approaching and connected by a callus: not toothed.*

1. VALLONIA, Risso. Shell minute, diaphanous, umbilicate: lip margin broadly reflected, nearly circular, white.

European; extending into the States east of the Rocky Mountains.

** *Shell large, umbilicate, lip with a small tooth at its base; sometimes also with a small parietal tooth.*

2. ULOSTOMA, Albers. Shell large, globosely depressed, aperture semicircular, lip tuberculately toothed at base. Horn color, sometimes banded with rufous.

Alleghany Mountains, from Vermont to Tennessee, and westward to the Rocky Mountains.

*** *Shell large, umbilicus covered or perforate, lip not toothed; with generally a small oblique parietal tooth.*

3. MESODON, Rafinesque. Shell large, subglobose or orbicularly depressed; aperture rounded lunar, the lip sometimes slightly dentately thickened at the base; parietal tooth, when present, small; umbilicus either covered by an expansion of the lip or partially covered. Generally uniform pale horn color.

Inhabits the entire United States, but two species only on the Pacific slope of the continent.

**** *Shell of moderate size, turbate or depressed; umbilicus closed; aperture trigonal, lip with a long lamellar tooth at base, and frequently a small tubercular tooth above, a large curved lamellar parietal tooth.*

4. XOLOTREMA, Rafinesque. Shell uniform horn color, depressed or turbate, frequently angulate or carinate on the periphery; base convex; aperture with always a lamellar curved parietal tooth, and a long lamellar basal tooth, with frequently also a small denticle on the superior part of the lip.

Inhabits from the Alleghany to the Rocky Mountains.

***** *Shell moderate in size, aperture trilobate, caused by denticles on the superior and inferior parts of the lip, and on the parietal wall.*

† *Umbilicus open.*

5. TRIODOPSIS, Rafinesque. Shell globosely depressed, umbilicus open, lip teeth small, nearly equidistant. Uniform horn color.

†† *Umbilicus closed.*

6. ISOGNOMOSTOMA, Fitzinger. Shell smaller, globosely depressed, umbilicus covered by the extremity of the lip; aperture three-lobed, the lip teeth small, the parietal tooth larger, blade-shaped. Horn color, frequently hirsute.

Eastern, Middle and Southern States, also Europe.

***** *Shell small, aperture narrowly transverse, basal, extending from the periphery to the axis of the shell; parietal wall with a long lamellar tooth, lip broad, with generally a notch in the centre.*

7. STENOTREMA, Rafinesque. Shell small, generally hirsute, horn color, depressed turbate above, very convex below; aperture narrow and long, basal, lip and parietal wall subparallel, the former with a long blade-shaped tooth, the latter either similar, with generally a notch in the middle, or, the notch being wider, with two teeth; umbilicus closed. Within the aperture, and near the axis, may be seen an accessory column or pillar, probably designed to assist the animal in retiring within its shell.

United States, east of Rocky Mountains.

***** *Shell small, depressed and ribbed-striate above, many-whorled; periphery generally carinate; convex beneath, showing several whorls; aperture with a V-shaped parietal tooth.*

† *Aperture tridentate, base exhibiting one and a half to two whorls.*

8. *DÆDALOCHILA*, Beck. Shell small, depressed, ribbed-striate, periphery angulate, below convex, showing more than one, sometimes nearly two, whorls, with a minute central perforation; lip auricular, frequently expanded, the place of the teeth being marked externally by scrobiculations; parietal tooth V-shaped, joined by a raised callus with the extremities of the lip.

Southern States, Mexico, Guatemala, Cuba, &c.

† *Shell planorboid, many-whorled; aperture with a V-shaped tooth, but no lip teeth.*

9. *POLYGRA*, Say. Shell planorboid, many-whorled, whorls narrow, ribbed above, periphery angulate; aperture small, subtrigonal, with a V-shaped parietal tooth, joined by a raised callus to the extremities of the lip; below plane, showing several whorls, with a narrow umbilicus. Horn color.

Gulf States and West Indies, also South America.

VALLONIA, Risso.

1. *Vallonia minuta*, Say.

Plate 7, figure 2.

Spire depressed, convex, whorls four, the last rapidly increasing and spreading at the mouth; thin, transparent, very minutely striated, or sometimes distantly costate; aperture orbicular, lip large, well rounded; umbilicus large. Light horn color, with generally a greenish tinge, lip white.

Diam. 2.5 mill.

Maine to South Carolina, and westward to the Rocky Mountains.

This species was described many years ago by Mr. Say, and his species has since been recognized as distinct by several con-

chologists, but the weight of opinion has been in favor of considering it identical with *Vallonia pulchella* of Europe. Mr. E. S. Morse has recently critically compared the two species, and discovered several differences which we have been able to confirm fully. *V. minuta* is more depressed, the whorls are not as large, the aperture wider, and the labrum not so much rounded above, while below it ends further towards the axis of the shell; the lip of *V. minuta* is at an angle of 27° from a line passing through the axis, while that of *V. pulchella* is 35° . The lingual dentition also differs. In order to exhibit the above differences in the shell satisfactorily, I have copied Morse's figures of *V. minuta* and *V. pulchella*, fig. 1 representing the latter. European authors have separated from *V. pulchella* a species in which the striae of growth are occasionally elevated into ridges, under the name of *V. costata*. I doubt the validity of this distinction, which is of importance to those American conchologists who maintain the identity of our shell with the European *pulchella* from the fact that in certain localities we also have the costate variety. *Helix alternata* and several other species of native Helices exhibit quite as great diversity as the *minuta* in this respect, and I am inclined to attribute the development of these ridges in the growth of the shell to local disturbing influences.*

ULOSTOMA, Albers.

† *Shell banded; no parietal tooth.*

1. *Ulostoma profunda*, Say.

Plate 7, fig. 3.

Orbicularly depressed; whorls 5—6, convex, strongly obliquely striate, with well-impressed suture; aperture subcircular, lip large, white, its extremities approaching with an obtuse tooth on the inner basal edge; base convex, umbilicus large, profound. Light horn color, with generally a broad reddish brown band above the periphery, and numerous narrow bands on the base, sometimes uniform pale horn color.

Diam. 28 mill., height 15 mill.

Western New York to Virginia, and eastwards to Nebraska.

*"The molluscan fauna of Harper's Ferry is distinguished for the development of heavy lines of growth, and acute prominent carinae on the shells of the species; and in the terrestrial shells by the depression of the spire." TRYON *on the Mollusca of Harper's Ferry, Va.*, Proceed. Acad. Nat. Sci. Phila., 1861. The same features obtain in the species of the mountainous district of East Tennessee.

** *Unicolored, with a parietal tooth.*

2. *Ulostoma* Sayi, Binney.

Plate 7, figure 4.

Orbicularly depressed, whorls 5—6, thin, regularly obliquely striate; aperture suborbicular, lip white, the margin narrowly reflected and tuberculately dentate on the base, the parietal wall toothed; umbilicus moderate and deep. Pale horn color.

Diam. 22, height 15 mill.

Maine to Illinois, and southwards to Pennsylvania, inhabiting mountains and elevated districts.

MESODON, Rafinesque.

This group embraces most of the larger species of *Helices* inhabiting North America east of the Rocky Mountains. In Cuba it is replaced by *Pachystoma*, a genus very closely allied in the form, size and coloration of the shell; (but in Jamaica the larger species of shells belong to *Pleurodonta*, quite a different type in every respect). A like alliance brings very closely together the species of *Ulostoma* just described, with the numerous European genus *Campylæa*, so that we have in the subfamily *Mesodontinæ* first an undoubted American representative of *Vallonia*, then a magnified repetition of the same form, with modifications in *Ulostoma* which is very close to European species. This type of shell in this country appears to have become further modified into the genus *Mesodon*, in which form it has flourished exceedingly. Upon tracing *Mesodon* southwards, we find the species becoming larger, heavier and more coarsely striate, and these changes culminate in *Pachystoma*. The curious relation of the *Pachystomæ* with extinct and expiring species of land shells of Madeira is another curious fact in conchological geography. I shall have occasion, more than once before leaving the genera composing the subfamily of which *Mesodon* is the type, to point out among the terrestrial shells of Europe stray individuals of undoubtedly American forms.

* *Dentate*.

† *Umbilicus covered*.

Mesodon albolabris, Say.

VARIETY DENTATA.

Plate 7, figure 6.

This species not unfrequently develops a tooth on the parietal wall, (see description under section **,) and in this state it closely resembles *M. exoleta*, but may be distinguished by its larger size, less convex body whorl, broader lip, more transverse aperture, and generally lighter substance.

The dentate variety of *albolabris* has been found in Maine, Massachusetts, Pennsylvania, Ohio, Iowa, Illinois, Michigan, &c.

1. Mesodon exoleta, Binney.

Plate 7, figure 8.

Ventricose, suborbicular, whorls 5—6, convex, texture heavy, suture well marked; body whorl large and convex; aperture rounded, lip reflected, the parietal wall toothed; umbilicus covered by the extremity of the lip. Light horn color.

Diam. 25, height 15 mill.

New York to Georgia, west of the Alleghany Mountains, and extending westward to Missouri.

2. Mesodon dentifera, Binney.

Plate 7, figure 9.

Depressed, spire flatly convex, base well rounded, whorls 5, delicately striate, suture distinct, but not deeply impressed; aperture wide, lip broadly reflected and covering the umbilicus, parietal wall armed with a prominent tooth. Yellowish horn color.

Diam. 19 mill.

Maine to Virginia, and westward to Ohio, inhabiting mountain ranges and highly elevated ground.

Readily distinguished from the former species by its more depressed form, &c.

3. *Mesodon Wheatleyi*, Bland.

Plate 7, figure 10.

Conoidally globose, spire somewhat elevated, with distinct sutures, thin, closely ribbed-striate, with microscopic granulations, hirsute; whorls $5\frac{1}{2}$, convex, the last well rounded, but slightly depressed at the aperture, and constricted; aperture obliquely lunate, with the parietal wall armed by a tooth; base convex, umbilical region excavated, but imperforate. Reddish horn-colored, the lip rose-colored.

Diam. 14, height 7 mill.

Mountains in Cherokee County, North Carolina.

Mr. Bland remarks upon the close relationship existing between this species and *M. Columbiana* which inhabits the Pacific States. Each is the only hirsute species of *Mesodon* of its region. The two are also allied in size, form and color.

4. *Mesodon Christyi*, Bland.

Plate 7, figure 11.

Depressed, spire obtuse, whorls $4\frac{1}{2}$, somewhat convex, descending at the aperture, texture solid, with close, oblique, rib-like striæ, periphery a little angular; aperture depressed, with a strong parietal tooth; base convex, excavated in the middle, imperforate. Dark horn color.

Diam. 10, height $4\frac{1}{2}$ mill.

Mountains in Cherokee County, North Carolina.

Mesodon Roemeri, Pfeiffer.

This species is very rarely furnished with a completely-covered umbilicus. See description in the perforate section, species 8.

†† *Umbilicus open.*

‡ *Shell rounded.*

5. *Mesodon thyroides*, Say.

Plate 8, figure 1.

Rounded, thin, regularly and closely obliquely striate; spire depressed, conical, suture distinct, but not deeply impressed; whorls 5, convex, the body large, well rounded, slightly declining at the aperture, behind which it is a little constricted; aperture obliquely semilunar, the lip moderately reflected, with a slight transverse tooth or varnish of callus near the top of the parietal wall; umbilicus open, but partially bounded by a raised acute dilatation of the lips. Uniform light horn or straw color.

Diam. 25, height 16 mill.

Inhabits plentifully the whole country east of the Rocky Mountains, but is particularly numerous in the Western States, becoming rare in New England, and partially replaced by *M. bucculenta* in the South.

This is one of our most beautiful species, its delicate texture, regular rib-like striae, pleasing color and frequently roseate lip, give it a particularly neat aspect. Until it has become quite mature, the only trace of the parietal tooth is frequently a slight uncolored thickening, appearing as though varnished. In the immature state it is likely to be confounded with young individuals of a small variety of *M. albolabris*, a species which always inhabits with it. It has also been very generally confounded with *M. bucculenta*, a smaller, more globose shell, the description of which follows.

6. *Mesodon bucculenta*, Gould.

Plate 8, figure 2.

Globose, rather thin, with delicate, oblique, regular raised striae; spire obtusely elevated, suture distinctly, but not deeply, marked; whorls 5, convex, body large, rounded compactly, a very little deflected towards the aperture; mouth lunate, with a broad white lip, partially covering the umbilicus; parietal tooth sometimes scarcely developed, but occasionally strong. Reddish horn color.

Diam. 16, height 10 mill.

Georgia, to Texas, Maryland, Eastern Pennsylvania, Western New York.

This species is allied closely to *M. thyroides* : it differs in its smaller size, more globular form, darker color and less open umbilicus. It was first described as a far Southern species, but has been recently ascertained to be common in the Middle States. A remarkable minor form of *thyroides* was described by Mr. W. G. Binney several years ago, from the vicinity of Philadelphia, and he declares his inability to distinguish it from forms of *bucculenta*. This shell is really *bucculenta*, and its identity was first pointed out by Dr. E. Michener, in the American Journal of Conchology, 1865. It has also been noticed in New York by DeKay, who described it in his Report under the name of *Helix rufa*. In the neighborhood of Philadelphia all the specimens of so-called *thyroides* that I have seen are the true *bucculenta*.

7. *Mesodon devia*, Gould.

Plate 8, figure 3.

Orbicularly depressed, rather thick, strongly obliquely striate; spire convex, suture moderately impressed; whorls 6, the last well rounded; aperture obliquely and transversely lunate, with a widely-reflexed white lip, which is somewhat toothed at the base, and impinges on the open umbilicus; parietal tooth trigonal, oblique, quite large. Dark horn color, nearly brown.

Diam. 20, height 11 mill.

Oregon.

Mesodon Columbiana.

VARIETY DENTATA.

Plate 8, figure 12.

This, which will be described among the non-dentate species, sometimes develops a parietal tooth. Mr. Bland, several years ago, (Annals N. Y. Lyceum, vii.,) mentioned that his cabinet contained a specimen with such a tooth. I have seen several specimens of this variety, and my cabinet contains them from three different localities.

‡‡ *Shell subangulate on the periphery.*

8. *Mesodon Roemeri*, Pfeiffer.

Plate 8, figure 4.

Shell depressed, rather thin, semi-transparent, closely, but faintly striate; spire a little elevated, suture slightly impressed; whorls 5, somewhat convex, the last one subcarinate or angulate on the periphery, scarcely descending to the aperture; aperture obliquely lunate, the lip well thickened, but hardly expanded above, though becoming towards the base well-reflected, covering partially the umbilicus, and rarely entirely closing it; parietal wall generally armed with a well-developed tooth. Horn-colored.

Diam. 21, height 10 mill.

Texas.

May be distinguished at once from all the other species by its depressed form and angulate periphery.

** *Not dentate.*

† *Umbilicus closed.*

‡ *Unicolored.*

9. *Mesodon major*, Binney.

Plate 8, figure 5.

Ventricose, convex, globosely turbinate, heavy, covered with coarse oblique striæ; spire, elevated, convex, suture well impressed; whorls 6, convex, the body whorl very large and subglobular, very slightly declining; aperture small, rounded lunate, lip thick, moderately wide, with a tooth-like elevation at the base near the body whorl, dilated and covering the umbilicus. Yellowish brown.

Diam. 44, height 33 mill.

Tennessee to Florida and Alabama.

Dr. Binney first described this as a species distinct from *M. albolabris*, and separated it on account of its larger size, more globose, elevated form, rounder aperture, coarser striæ, &c. Messrs. W. G. Binney, Newcomb, Gould and myself admit its validity, but Mr. Bland, on the contrary, unites the two,

believing that *major* is only *albolabris* living in situations highly favorable to its growth, and gives measurements of specimens from different northern and southern localities, showing a gradual increase in size, as well as variations of form. I believe that the true *major* inhabits the far Southern States, where it replaces *albolabris*. and I doubt very much whether it was ever found North of Southern Tennessee.

10. *Mesodon albolabris*, Say.

Plate 7, figures 5, 6, 7.

Depressed orbicular, moderately thick, closely obliquely striate, with crowded, slightly-impressed revolving lines; spire convex, suture not deeply impressed; whorls 5—6, flattened convex, the body a little deflected at the aperture, and contracted behind the lip; mouth lunar, with a widely-reflected white lip, which, at the base, covers the umbilicus. Yellowish brown or light chestnut color.

Variety with a parietal denticle.

Diam. 25, height 15 mill.

Inhabits from Canada to South Carolina, and westward to Arkansas and Nebraska.

One of our most common species. This, as well as all others of the group, when immature, is furnished with an open umbilicus and a sharp unreflected lip; and in this state it is exceedingly difficult to distinguish the species one from another.

11. *Mesodon Pennsylvania*, Green.

Plate 8, figure 9.

Turbinately subglobose, moderately thick, translucent, with crowded, elevated oblique striæ; spire convexly elevated, suture distinct; whorls 6, convex; aperture subtriangular, contracted behind the lip, which is white, and narrowly reflected, and slightly thickened internally at the base; umbilical region indented, umbilicus covered. Bright horn color.

Diam. 13—18 mill.

Western Pennsylvania, Ohio, Illinois.

This species is distinguished from *M. clausa* by its imperforate base and triangular aperture, and from the following species by its more turbinate form, as well as by the aperture.

12. Mesodon Mitchelliana, Lea.

Plate 8, figure 10.

Subglobose, moderately thick, translucent, finely striate; spire convexly conical, suture not deeply marked; whorls 5, the last well rounded, contracted behind the lip above, but the groove becoming indistinct towards the base; aperture rounded, lip white, narrowly reflected; base very convex, imperforate. Light horn color.

Diam. 15, height 9 mill.

Found only in Ohio.

For the distinction between *M. Pennsylvanica* and this species, see the description of the former.

13. Mesodon divesta, Gould.

Plate 8, figure 11.

Depressed orbicular, moderately thick, coarsely obliquely striated; spire a little convex, with well-marked suture; whorls 6, the last subangulate at the periphery; aperture lunate, very oblique, lip white, broadly reflected, horizontal at base, its outer portion flexuous; base convex, umbilical region excavated, but covered. Dingy horn color.

Diam. 18, height 7 mill.

Washington Springs, Arkansas.

Distinguished by its depressed form. Although described nearly twenty years ago, no other locality than that above given has been discovered.

‡‡ *Banded.***14. Mesodon multilineata, Say.**

Plate 8, figure 8.

Depressed orbicular, rather thin, closely obliquely striate; spire convexly conical, suture deeply impressed; whorls 5—6, very convex, the last considerably deflected at the aperture; aperture lunate, the lip white, narrowly reflected and dilated into and covering the umbilicus. Horn color, with more or

less numerous reddish brown revolving bands of varying width.

Diam. 25, height 16 mill.

Western and North-western States.

This is one of our most beautiful species, and is extremely numerous in the region inhabited by it. A variety is occasionally met with, having a uniform dark brown epidermis, (middle figure,) and Dr. Binney mentions having seen one or two specimens in which the epidermis was pure white.

†† *Umbilicus open.*

‡ *Color mottled.*

15. *Mesodon Townsendiana*, Lea.

Plate 8, figures 6—7.

Orbicular, rather thick, with oblique, irregular, coarse striæ and fine revolving lines, the body whorl malleated obliquely; spire convexly conical, suture moderately impressed; whorls $5\frac{1}{2}$, the last somewhat deflected at the aperture; aperture lunate, oblique, lip white, very much thickened; base convex, umbilical region subangulate, umbilicus moderate. Yellow and brown variegated by the malleations.

Diam. 30, height 18 mill.

Oregon.

A smaller, more compact, more elevated, not malleated shell, which, if not distinct, may be designated as *variety minor*; inhabits Idaho and Nebraska, (fig. 6).

†† *Unicolored.*

§ *Hirsute.*

16. *Mesodon Columbiana*, Lea.

Plate 8, figures 12, 13, 14.

Depressed orbicular, covered with short close hairs arranged in lozenge; spire depressed conical, suture well impressed; whorls 6, the last rapidly increasing, very convex, deeply constricted behind the lip and descending to the aperture; aperture narrowly lunate, lip white, widely reflected, partly

covering the umbilicus; base very convex. Yellowish horn color.

Diam. 16, height 10 mill.

Oregon.

Peculiar in this group, for its very close arrangement of short bristles all over the surface; the old shells are frequently denuded of these, but then the scars of their insertion are distinctly visible with a glass. As already mentioned, this species sometimes develops a strong, oblique, parietal tooth, (fig. 12).

§§ *Not hirsute*.

17. *Mesodon Downieana*, Bland.

Plate 8, figure 15.

Subglobose, thin, subpellucid, with obsolete rib-like striæ and crowded minute revolving lines; spire depressed conical, suture moderately impressed; whorls 5, convex, the last tumid, scarcely descending, constricted behind the lip; aperture obliquely lunate, lip white, reflected narrowly, nearly covering the umbilicus; base convex. Greenish horn color.

Diam. 10.5, height 6 mill.

University Place, Franklin County, Tennessee.

Like *M. Christyi*, Bland, in form, but has no parietal tooth.

18. *Mesodon clausa*, Say.

Plate 8, figure 16.

Subglobose, moderately thick, with fine oblique striæ; spire convex, with distinct suture; whorls 5, convex, the last large, contracted behind the lip; aperture rounded, lip white, narrowly reflected and nearly covering the umbilicus; base very convex. Light yellowish brown, shining.

Diam. 13—15 mill.

Inhabits all the Western States from the Great Lakes to Mississippi and Alabama.

This species is of the same size as *M. Pennsylvanica* and *M. Mitchelliana*, inhabiting partially the same region. Its distinctive characters have been already pointed out. It is most abundant in the southwest in a semi-fossil condition.

XOLOTREMA, Rafinesque.

There are but five species known to belong to this section of the Helices; characterized by a lamellar tooth on the base of the aperture, and a covered umbilicus. We first indicated its generic value, and gave a list of species belonging to it, in the American Journal of Conchology, p. 81, 1865. These shells inhabit the middle region of the United States rather sparingly, being nowhere very numerous. There are two groups of species, two of them being somewhat rounded trochiform, while the other three are depressed, and generally furnished with an additional tooth on the upper part of the labrum, making the aperture tridentate.

* *Shell elevated.*

1. Xolotrema elevata, Say.

Plate 9, figure 1

Shell convexly conical, thick, finely obliquely striated; spire elevated, with a well-impressed suture; whorls nearly seven, convex, slowly increasing, the body large and well rounded; aperture somewhat triangular, contracted by the lip, which is thickened, but not very broadly reflected, and covers the umbilicus; a long lamellar tooth occupies nearly the whole basal part of the lip, and the pillar lip is furnished with a stout tooth, curving inwards above; the extremities of the labrum frequently connected by a well-defined callus. Yellowish horn color.

Diam. 23, height 16 mill.

From Western New York to West Virginia, and westward to Missouri.

Mr. W. G. Binney received two specimens, collected by the late Major Kennicott in Wisconsin, which were remarkable from having each a brown band revolving upon its periphery.

2. Xolotrema Clarkii, Lea.

Plate 9, figure 2.

Shell globosely conical, moderately thick, finely striated; spire obtusely conical, suture moderate; whorls seven, convex, slowly increasing, the body well rounded; aperture subtriangular, the lip reflected and thickened, entirely covering the um-

bilicus; a long lamellar tooth on the base of the lip, and a strong curved tooth on the parietal wall. Reddish horn color.

Diam. 14, height 9 mill.

Cherokee County, North Carolina.

A beautiful little species, almost a pigmy *elevata*; the whorls of the spire are not so convex, however, as they are in that species.

*** Shell depressed.*

3. *Xolotrema obstricta*, Say.

Plate 9, figure 3.

Shell depressed, acutely carinated, the carinæ visible on all save the apical whorls of the spire; spire depressed convex; whorls five, more convex below, covered with distant sharp oblique costæ, which fringe the edge of the carina in crossing it, with frequently slight, close, revolving lines; aperture trilobate, lip widely reflected, parietal tooth strong, oblique, superior lip tooth small, inferior lip tooth a long blade upon the base of the lip; umbilicus covered. Pale to dark brown.

Diam. 22, height 8 mill.

Western and Southern States.

This species differs from the following in being *always* strongly carinate, and in not having hispid epidermal projections.

4. *Xolotrema palliata*, Say.

Plate 9, figure 4.

Shell depressed above, a little more convex below, with elevated oblique ribs, the epidermis rugose, with close, minute hispid prominences; whorls five, not very convex, subangulate to carinate at the periphery; aperture trilobate, caused by three teeth, the largest of which is parietal and oblique, the others are respectively on the upper and lower portions of the labrum, the lower one being blade-shaped; umbilicus covered. Light to dark brown.

Diam. 23, height 10 mill.

Alleghany Mountains and westward, Vermont, (W. G. Binney,) Iowa, Michigan, Kentucky, Tennessee, &c.

5. *Xolotrema appressa*, Say.

Plate 9, figures 11, 7.

Shell depressed; spire only slightly raised, suture distinct; whorls 5, a little convex, the last subangulate at the periphery, and constricted behind the widely-reflected lip of the aperture; obliquely ribbed-striate above, smooth beneath; aperture trilobate, with a long oblique parietal tooth and two small lip teeth, of which one is on the upper and the other on the lower part of the lip; umbilicus filled by a deposit of callus. Yellowish horn color.

Diam. 18 mill.

Principally west of the Alleghany Mountains, from New York to Georgia, and westwards to Alabama, Tennessee and Illinois. Wilmington, N. C., and City Point, Va., (Thomas Bland).

Much smaller in size, and without the hispid surface of *X. palliata*; it is also flatter. Sometimes the lip teeth are not well developed. (Fig. 7.)

TRIODOPSIS Rafinesque.

This genus differs from the foregoing in the following particulars:—The umbilicus is open, the basal tooth of the tridentate aperture is tubercular instead of lamelliform, and the shell is smaller.

The species are widely distributed, some of them being found in all parts of the United States, and a few as far to the southwards as Central America. The species of *Triodopsis*, like those of some other groups, in their distribution seem to mutually replace one another, thus forming, in the opinion of the older writers, geographical varieties rather than species. That several of them had a common parentage is obvious; but, inasmuch as the departure of each from the common type, though slight, appears to be permanent, these forms must be regarded as true species.

1. *Triodopsis tridentata*, Say.

Plate 9, figures 6, 13.

Shell depressed, spire somewhat convex, suture moderately impressed; whorls 5—6, a little convex, obliquely ridged-striate; aperture trilobate, lip widely reflected, on the parietal wall is

placed an oblique tooth, and small marginal teeth are on the upper and the basal portions of the labrum respectively; base convex, umbilicus open and deep. Horn color.

Diam. (large var.) 23, height 9 mill.; (small var.,) diam. 13, height 5.5 mill.

Inhabits all the States east of Rocky Mountains.

This shell is generally larger than the next, from which it differs in having a more depressed form and much smaller teeth.

2. *Triodopsis fallax*, Say.

Plate 9, figure 12.

Shell convex, spire somewhat elevated, suture distinct; whorls 5, moderately convex, obliquely coarsely striate; aperture trilobate, the parietal lamelliform tooth large and oblique, the lip teeth large and flattened, the upper one deflected into the aperture; base moderately convex, umbilicus open. Light horn color.

Diam. 11, height 6 mill.

Inhabits the whole country east of Rocky Mountains.

This shell, as mentioned under the description of *T. tridentata*, differs from that species by its smaller size, more elevated spire and larger teeth; the upper lip tooth is remarkable, being quite large, somewhat blade-shaped, and its surface bent into the aperture. I regard this shell as *fallax*, in deference to the opinions of Messrs. W. G. Binney, Bland, &c., but the fact is that Say confounded two species under this name, and his *description* is actually drawn up from a specimen of *introferens*, var. *minor*, as *fallax* is not found in the vicinity of Philadelphia—the habitat given by Say.

3. *Triodopsis introferens*, Bland.

Plate 9, figure 5.

Depressed, thin, with rib-like striæ; spire convex, but slightly elevated; whorls 5—6, somewhat rounded, the last descending, constricted behind the lip, with exterior pits marking the position of the lip teeth within the aperture, periphery subangular; aperture trilobate, parietal tooth oblique, lamelliform, basal lip tooth submarginal, lamelliform, continued within the aperture,

where it forms a strong white tubercle, upper lip tooth transverse, and opposite to the external periphery; base convex, umbilicate, grooved within the umbilicus. Yellowish horn color.

Diam. 11—15, height 6—7 mill.

North Carolina; vicinity of Philadelphia, Pa., (small variety). Distinguished immediately from *tridentata* and *fallax* by its narrower umbilicus and groove, and especially by its tubercular basal tooth. See description of *T. fallax*.

4. *Triodopsis Hopetonensis*, Shuttleworth.

Plate 9, figure 9.

Depressed, thin, ribbed-striate; spire obtusely convex, but not much elevated, suture distinct; whorls $5\frac{1}{2}$, somewhat convex, more convex beneath, constricted behind the aperture; aperture trilobate, a sharp parietal tooth and a small submarginal one on the upper and the lower lip; narrowly umbilicated. Light horn color.

Diam. 13, height 6 mill. (Var. major.)

Sullivan's Island, S. C.; Hopeton and St Simon's Isle, Geo.; Florida.

Distinguished from *fallax* by its smaller umbilicus, less thickened lip and teeth, and by the latter being more remote, one from another. The dimensions given above are those of a large specimen; ordinarily they attain but two-thirds of the size.

5. *Triodopsis Yucantanea*, Morelet.

Plate 9, figure 17.

Shell depressed, almost flat above, but quite convex below the angular periphery; whorls five, obliquely ridged above and striate beneath, constricted behind the reflected lip; aperture trilobate, parietal tooth very oblique, nearly V-shaped, with one lip tooth opposite to it, and a smaller erect one upon the centre of the basal portion of the lip; umbilicus rather wide and deep. Light horn color.

Diam. 8, height 3 mill.

Isle of Carmen, Yucatan.

This species is introduced to show that a form very closely allied to our own shells, inhabits a far-distant locality. Probably the intermediate country of Mexico contains undiscovered species exhibiting the same characteristics. The spire is represented too much elevated in the figure.

6. *Triodopsis vultuosa*, Gould.

Plate 9, figure 14.

Shell globosely depressed, closely delicately striate, rather solid; spire convex, not much elevated, suture well impressed; whorls $5\frac{1}{2}$, convex, slowly increasing, the last subangular, and deflected at the aperture, well rounded below, with a moderate umbilicus; aperture lunate, its outline somewhat sinuous, parietal tooth a broad lamina, oblique, joined to the lip below. lower lip tooth small, upper lip tooth expanded and reflexed. Dark horn color.

Diam. 10, height 5 mill.

Texas.

Intermediate between *H. fallax* and *H. Texasiana*.

7. *Triodopsis Mullani*, Bland and Cooper.

Plate 9, figure 15.

Shell globosely depressed, irregularly striate, shining, with a thin epidermis, covered with minute spiral lines and tubercles, (the latter probably the scars of hairs); whorls 6, convex, much constricted behind the aperture, and smoother on the base; aperture trilobate, parietal tooth small, linguiform, lower lip tooth lamelliform, upper one small, and sometimes obsolete; umbilicus moderate, partially covered by the lip. Dark horn color.

Diam. 13·5, height 7 mill.

Washington Territory and Oregon.

Darker in color, with smaller umbilicus and differently formed teeth from *tridentata*.

8. *Triodopsis loricata*, Gould.

Plate 9, figures 16, 19.

Shell small, orbicularly depressed; spire convex, not much elevated, suture well impressed; whorls 5, convex, thin, obliquely striate, with small epidermal scales or scars, and in fresh specimens hispid, very much contracted behind the lip; aperture transversely trilobate, the very oblique parietal tooth quite small, and the two lip teeth merely slight elevations of the surface; base very convex, umbilicus narrow and deep, slightly circumscribed by the lip. Dark horn color.

Diam. 6, height 4 mill.

“ 8, “ 5 “ (var. major.

California.

In general appearance this shell is singularly allied to *Stenotrema monodon*; it is distinguished principally by the small, scarcely-developed lip teeth, and by its geographical distribution. The roughened appearance of the epidermis, as it generally exists when denuded of hairs, being the scars of their insertion, is another link connecting this with *Stenotrema*.

ISOGNOMOSTOMA, Fitzinger.

This genus has for its type *Helix personata* of Lamarek, a common European shell, with which the two following species are closely allied. The shells are more elevated, and revolve more closely than in *Triodopsis*, appearing, when viewed from above, to be very like *Stenotrema*. The umbilicus is covered in this, differing from the last genus, as well as by the generally smaller size.

1. *Isognomostoma inflecta*, Say.

Plate 9, figure 10.

Shell depressed, convex; spire slightly raised, suture not deep; whorls 5, minutely obliquely striate, sometimes hirsute, very much contracted behind the lip; aperture trilobed, parietal tooth almost transverse, large and blade-shaped, basal lip tooth a small upright tubercle, upper lip tooth in the middle of the

outer lip, a somewhat larger tubercle, and inflected, lip covering the umbilicus. Light horn color.

Diam. 11, height 4.5 mill.

Western Pennsylvania to Michigan, and southwards to Texas.

The constriction of the whorl behind the aperture is so great in this species that the reflected lip does not project beyond the general circumference of the shell.

2. *Isognomostoma Rugeli*, Shuttleworth.

Plate 9, figure 8.

Shell convex, depressed, rather smooth; spire convex, but little elevated, suture well marked; whorls $5\frac{1}{2}$, narrow, closely revolving, the last very much contracted in the centre behind the lip; aperture small, with a prominent bent, oblique parietal, lamellar tooth, a small upright tubercular basal tooth, and a large lamellar tooth opposite to the parietal tooth, and situated entirely farther within the aperture; base convex, umbilicus covered. Light horn color.

Diam. 10—13, height 5—6, mill.

Tennessee and North Carolina.

Easily distinguished from *I. inflecta* by its upper lip tooth, situated far within the aperture.

STENOTREMA, Rafinesque.

In this genus the shell is orbicular and generally hirsute, the whorls revolve closely, and the aperture is basal and narrowly transverse, extending from the periphery to the axis. In most of the species the dentition of the aperture in *Stenotrema* is peculiar to this genus—namely, a long transverse parietal blade and a parallel thickening of the basal portion of the lip, which is frequently incised in the middle.

Stenotrema inhabits the entire extent of the United States, and several of its species are widely diffused, whilst others, on the contrary, are extremely local, and two or three of them very rare and highly esteemed.

* *Umbilicus open, or partly covered.*

1. *Stenotrema monodon*, Rackett.

Plate 9, figures 18, 20.

Shell convex, depressed; spire slightly elevated, suture very distinct; whorls 5, convex, narrow, finely striated and minutely hirsute, or covered with the scars of the hairs, deeply grooved behind the reflected lip; aperture transverse, with a long oblique parietal tooth, outer lip narrowly reflected, its basal termination more or less encroaching on the umbilicus; under surface very convex, much impressed around the deep, narrow, more or less closed axis. Dark horn color.

Diam. 7—10, height $3\frac{1}{2}$ — $5\frac{1}{2}$ mill.

Inhabits the whole country east of the Rocky Mountains.

This is a somewhat variable species, and varieties of it have been considered distinct by several American conchologists. The typical *monodon* is supposed to be restricted to those species of large growth and open umbilicus, while *fraterna*, of Say, is the name applied to those having the umbilicus covered. A more convex variety, with narrower whorls, and generally smaller size, is called *H. Leaii*, Ward. We are told that the latter affects moist situations, while the true *monodon* inhabits dry places. I agree with Messrs. Binney and Bland in believing that we have not yet sufficient data to justify the separation into species of these varieties of *monodon*.

** *Umbilicus closed.*

† *Periphery rounded.*

‡ *Outer lip incised in the middle.*

2. *Stenotrema stenotrema*, Ferussac.

Plate 9, figures 21, 30.

Shell subglobose, depressed; spire convex, somewhat conical, suture well impressed; whorls 5, well rounded, narrow, slowly increasing in size, subangulate on the periphery, more convex below, and slightly impressed in the umbilical region, finely striate, and covered with close short hairs; aperture very narrow, extending to the axis of the shell below, and almost closed by the long lamelliform, outwardly projecting parietal tooth, the narrow depressed outer lip is reflected close upon the whorl, with a small triangular notch in its centre. Chestnut brown, lips white or pink.

Diam. 10, height 6 mill.

Western and Southern States.

3. *Stenotrema hirsuta*, Say.

Plate 9, figure 24.

Shell subglobose, hairy; spire convex, elevated, suture deep; whorls 5, well rounded, periphery subangulate, shell very convex below, umbilicus covered; aperture narrowly transverse, nearly closed by the lamelliform parietal tooth, the outer lip with a triangular notch upon its basal portion.

Diam. 6, height 4 mill.

New England, Middle and Western States.

The following are the chief differences between this species and the preceding:—*Hirsuta* is smaller, more globose, its parietal tooth somewhat sinuous, and terminating abruptly, and the lip notch larger proportionally. *S. stenotrema* has a smaller and more central lip notch, and its large parietal tooth is regularly bow-shaped over its edge, instead of being sinuous and abruptly terminated. The species are both of them widely distributed, but the range of *hirsuta* is far greater than that of *stenotrema*.

†† *Outer lip not incised in the middle.*

4. *Stenotrema maxillata*, Gould.

Plate 9, figures 31, 35.

Shell small, globose; spire conical, convex, suture well impressed, subangular on the periphery, and more convex below; whorls 5, narrow; aperture transverse, nearly filled by a long lamellar parietal tooth, lip closely appressed, narrow, with a lamina behind its margin, and scarcely visible on account of the parietal tooth being in front of it; this lamina tapers out to the margin of the lip at its superior termination; umbilicus covered. Light chestnut color.

Diam. 6, height 4 mill.

Tennessee, Chattahoochee River, Georgia.

Readily distinguished from *hirsuta* by its entire lip and the raised lamellar tooth behind it.

5. *Stenotrema germana*, Gould.

Plate 9, figures 22, 23.

Shell small, solid, imperforate; spire depressed conical above; whorls 5, narrow, subangular at the periphery, and very convex below; aperture narrowly transverse, the parietal wall with a long blade-shaped tooth. Horn color, with a few scattered hairs.

Diam. 7.5, height 5 mill.

Oregon.

Very like *S. monodon*, but the base is more convex, and not indented around the axis. The hairs are much fewer in number than in *S. hirsuta*.

†† *Periphery carinate.*

‡ *Outer lip incised in the middle.*

§ *Lenticular species.*

6. *Stenotrema spinosa*, Lea.

Plate 9, figures 26, 28, 29.

Lenticular, upper surface depressed conical, suture slightly marked; whorls 6, flat above, carinate at the periphery, and convex below, slowly increasing in size, and covered with prostrate hairs in fresh specimens; aperture very narrow, lip slightly reflected and thickened, slightly incised in the middle, parietal tooth long, narrow, projecting, extending from the axis to the angle of the lip above; umbilical region slightly indented. Dark chestnut color.

Diam. 14, height 5 mill.

Mountainous regions of East Tennessee, and the northern parts of Alabama and Georgia.

The revolution of the whorls of the spire causes a very slight projection of the carina of each at the suture. Young shells are widely umbilicate, with hairs covering the surface, and projecting around the periphery like a fringe.

7. Stenotrema Edgariana, Lea.

Plate 9, figure 27.

Shell somewhat lenticular; spire depressed trochiform, suture distinct; whorls 5, flattened above, periphery carinate, the base convex, imperforate; aperture narrowly transverse, the outer lip notched in the middle, the parietal lip with a long blade-shaped tooth. Dark brown, hairy when fresh.

Diam. 10, alt. 5 mill.

Cumberland Mountains, Tennessee.

Smaller, more elevated, and more convex beneath, than *S. spinosa*. The parietal tooth most resembles that of *S. stenotrema*, while the form of that of *S. spinosa* is more like that of *hirsuta*. Another difference is in the suture, which, in the present species, is well marked.

§§ *Elevated Species.***8. Stenotrema Edwardsii, Bland.**

Plate 9, figure 34.

Lenticular, imperforate, carinate, obsolete near the aperture, rather thin; spire slightly convex; whorls 5, narrow, slowly increasing, with flat or erect bristles on the epidermis, or their scars when denuded of them; base very convex, but slightly indented around the axis, with impressed spiral lines under the epidermis; aperture narrow, transverse, with a narrow, slightly-curved, blade-shaped parietal tooth, upper margin of the lip scarcely reflected, basal portion reflected a little, and appressed partially to the body whorl, with a tooth-like callus within, and an almost obsolete central notch. Dark brown.

Diam. 9, alt. 5 mill.

Mountains in Fayette, or Green Brier County, Virginia.

This shell differs from *S. hirsuta* in its angulated periphery, and less distinct notch in the lip.

9. Stenotrema labrosa, Bland.

Plate 9, figure 25.

Shell imperforate, lenticular, carinated, solid, finely obliquely striate, epidermis thin, with prostrate hairs when fresh; spire

slightly raised, suture a little impressed; whorls $5\frac{1}{2}$, narrow, slowly enlarging, the last deflexed and constricted behind the lip; aperture transverse, narrow, ear-shaped, the extremities of the lip connected by a callus and a long blade-shaped tooth upon the body whorl, lip with a deep, wide notch in the middle. Dark brown.

Diam. 12.5, alt. 6.5 mill.

Arkansas, Alabama and Tennessee.

Distinguished from *S. Edgariana* by the thickened and reflected lip, and its deep, wide notch.

‡‡ *Outer lip not incised in the middle.*

10. *Stenotrema barbigeræ*, Redfield.

Plate 9, figures 32, 33.

Shell somewhat lenticular, sharply carinate, the carinæ of the spire whorls overlapping the suture; spire convexly conical; whorls flattened, narrow, $5\frac{1}{2}$ in number; base convex; aperture narrow, transverse, extending from the periphery to the axis, which is covered by the lip; lip reflected, not dentate or incised, parietal tooth, a long lamina running parallel with it. Dark horn color, epidermis striate, hirsute, forming cilia on the periphery.

Diam. 10, height 6 mill.

North West Georgia.

Like the other carinate *Stenotremæ*, this is a mountain species, and inhabits the same region. It is readily distinguished from its allies by the absence of a lip notch.

DÆDALOCHILA, Beck.

This is a very peculiar group, embracing quite a number of species of subtropical distribution, most of the species occurring in the southern Gulf States, and in Texas and Mexico; they pass the Rocky Mountains, and appear on the west coast of Mexico. Owing to the comparatively unexplored countries which they inhabit, the species of *Dædalochila* have generally been only recently described, and it is not at all unlikely that many additional ones remain to be characterized.

In general appearance the species are very closely allied, one with another, and the differences are generally found in the teeth and shape of the apertures.

* *Margin of aperture regular.*

† *With two small marginal teeth on its outer lip.*

‡ *Diameter = 6 millimetres.*

1. *Dædalochila leporina*, Gould.

Plate 10, figures 1, 4.

Shell small, lenticular, slightly hairy, minutely striate; spire convex, depressed; whorls 5, somewhat convex, the last subangulate at the periphery; base convex, the umbilicus nearly covered, umbilical region excavated; aperture lunate, lip incumbent, reflexed, with a central sinus, the sides of which are formed by two teeth, parietal tooth V-shaped. Chestnut color, the lip sometimes roseate.

Diam. 5, height 3 mill.

Georgia, Arkansas, Mississippi, Indiana, Illinois, Tennessee.

It will be seen that this species has a wide distribution, although it has only been noticed hitherto at one or two places in each of the States mentioned.

2. *Dædalochila pustuloides*, Bland.

Plate 10, figures 2, 3.

Shell small, planorboid, thin, delicately striate, slightly hirsute; spire scarcely elevated; whorls $4\frac{1}{2}$, narrow, a little convex above, subangular at the periphery, and quite convex below, gibbous, constricted and suddenly deflexed at the aperture; aperture lunate with a lamelliform parietal tooth joined to the upper extremity of the lip by a sharp callus, outer lip reflected, thickened within, with two internal teeth, and a deep notch between them; umbilicus wide and deep. Horn color.

Diam. 5.5, height 2.5 mill.

Alabama; near Darien, Georgia.

Respecting this species, Mr. Bland says, "*H. pustuloides* is intermediate in size between *H. pustula* and *H. leporina*, is less globose than the former, and more sparingly hirsute. It differs widely from both in the character of the umbilicus; the aperture is much like that of *pustula*, but more narrow than that of *leporina*. The inferior tooth on the peristome is more developed laterally than in *H. pustula*—indeed, it has a somewhat bifid appearance, in which respect it is more allied to *H. leporina*."

3. *Dædalochila pustula*, Ferussac.

Plate 10, figures 6, 17.

Shell small, depressed, lightly striate; spire scarcely raised, suture well impressed; whorls 4, convex, subangulate on the periphery, and more convex below it, deflected at the aperture; aperture narrow, arcuate, impinging on the umbilicus; teeth as usual in the group, viz., one V-shaped parietal tooth and two tubercular lip teeth margining a central notch; umbilicus small and deep, with a groove revolving within it, which forms a raised lamina on the basal part of the interior of the shell. Reddish brown, with short hairs.

Diam. 5, height 3 mill.

Texas, Georgia; St. Augustine, Florida.

This shell and *pustuloides* were confounded by authors until recently distinguished, and the latter described by Bland. *D. pustula* is distinguished by its narrower umbilicus, and the umbilical groove, and corresponding raised internal lamina; the latter is only to be seen by breaking the whorl.

4. *Dædalochila Texasiana*, Moricand.

Plate 10, figures 5, 36, 38.

Shell orbicular, depressed, rather solid, ridged above, smooth below; spire scarcely elevated, suture moderately impressed; whorls 5, slightly convex above, subangular at periphery, quite convex below, deflected at the aperture; aperture crescentic, with the lip margins joined by a large V-shaped tooth on the body whorl, outer lip with two denticles closely placed, and a pit between them; umbilicus minutely perforate. Pale horn color.

Diam. 9, height 4 mill.

Texas; Tamaulipas, Mexico.

5. *Dædalochila triodontoides*, Bland.

Plate 10, figures 10, 31.

Perforate, orbicular, depressed, thin, subpellucid, obsoletely striate above, smooth beneath; whorls 5, somewhat convex, deflected at the aperture, subangulate on the periphery, and very convex below; aperture lunate, oblique, the extremities of the

reflected lip connected on the body whorl by a V-shaped tooth, the lip having two small teeth situated far apart, one on the circumference the other on the base. Pale horn color.

Diam. 9.5, alt. 5 mill.

De Witt County, Texas; Corpus Christi, Texas.

More delicate, not as distinctly ribbed, more elevated than *D. Texasiana*; the lip teeth also are smaller and farther apart.

6. *Dædalochila ventrosula*, Pfeiffer.

Plate 10, figures 39, 35.

Orbicular, depressed, minutely perforated, thin, shining; spire slightly raised, suture well impressed; whorls 5, but little convex, finely striate above, smooth and very convex beneath, the periphery subangulate, much constricted behind the aperture; aperture rounded lunate, the terminations of the lip joined by a V-shaped parietal tooth; basal portion of lip with two white denticles, and circumference with a large lamellar tooth. Horn color.

Diam. 8, height 4.5 mill.

Texas and Mexico.

Sometimes attains to one-half larger size.

7. *Dædalochila Hindsii*, Pfeiffer.

Plate 10, figures 44, 24.

Shell depressed, orbicular, narrowly umbilicate, finely striate, diaphanous, shining; spire somewhat conical; whorls 5, but slightly convex, more convex below, deflected at the aperture and constricted behind it; aperture lunate, the lip slightly reflected, and its extremities united on the body whorl by a callus and a V-shaped tooth; on the lip are two small basal teeth and a large lamellar tooth opposite to the parietal one. Color light corneous.

Diam. 8, alt. 4.5 mill.

Texas and Mexico.

‡‡ *Diameter* = 10 millimetres.

8. *Dædalochila tholus*, W. G. Binney.

Plate 10, figures 7, 9.

Shell solid, white, shining, ribbed above, smooth below; spire depressed, conical, suture distinct; whorls 7, convex, slightly angular on the periphery; umbilicus broad and shallow, about half the diameter of the shell, showing $2\frac{1}{2}$ grooved whorls; aperture semi-oval, with a thickened, scarcely reflected lip bearing one median and one basal tooth—both small, parietal tooth large, rhomboidal.

Diam. 11, height 4 mill.

Texas.

9. *Dædalochila Mooreana*, W. G. Binney.

Plate 10, figure 8.

Depressed, carinated, white, strongly striate above and nearly smooth beneath; spire somewhat raised, suture deep; whorls 6, the last much deflexed at the aperture; umbilicus narrower than in *D. tholus*, exhibiting $1\frac{1}{2}$ whorls fully; aperture semi-oval, lip broad, heavy, but slightly reflected with two marginal teeth, of which one is basal, and the other sub-basal, parietal tooth large, rhomboidal.

Diam. 10, height 35 mill.

Texas.

It is questionable whether this and the forgoing are not varieties of the same species. The only difference is in the narrower umbilicus, broader lip and lower position of the lip-teeth in *Mooreana*.

*

* *

Mexican Species.

10. *Dædalochila Behrii*, Gabb.

Plate 10, figures 40, 41, 43.

Shell planorboid, coarsely ridged above, striate below; whorls 5, quite convex, subangular at the periphery and very much deflected and constricted behind the aperture; umbilicus broad with a minute central perforation; aperture rounded, the

lip expanding, its extremities approaching and connected by a large V-shaped tooth, there is also a large marginal basal tooth, and a smaller tubercular tooth on the middle of the lip. White, (bleached).

Diam. 15, height 4.5 mill.

Guaymas, Mexico.

† † *With three small marginal teeth on the outer lip.*

*

* *

Mexican Species.

11. *Dædalochila acute-dentata*, W. G. Binney.

Plate 10, figures 11, 13.

Shell planorboid, whitish, smooth, whorls 6, very convex, spire scarcely elevated, suture distinct; the body whorl oblique, inflated, deflected at the aperture and scrobiculate behind the lip; aperture small, ringent, lip circular, its extremities joined by a broad angular tooth on the body whorl; there are three lip teeth, one of them on the basal edge, perpendicular and short, the other two are further within and form slight elongated horizontal laminæ, causing pits on the outer surface of the whorl.

Diam. 14, alt. 4 mill.

Cinaloa, on Mazatlan River, Mexico.

12. *Dædalochila Loisa*, W. G. Binney.

Plate 10, figures 12, 14.

Shell planorboid, whitish, scarcely striate, suture slight; whorls 5, the last somewhat swollen, deflected channelled, and with two pits behind the lips; aperture ringent, 5-dentate, one on the parietal wall, large subtrigonal, connecting the lip extremities, the heavy lip slightly reflected, is armed with four teeth, two of them short, stout and perpendicular on the edge near the columella, while superior to them and farther within are two short, slender horizontal laminæ.

Diam. 13, alt. 5 mill.

Cinaloa, on Mazatlan River, Mexico.

Perhaps only a variety of *D. acute-dentata*, in which an additional basal tooth takes the place of a scarcely tooth-like elevation in the typical *acute-dentata*.

13. Dædalochila Ariadne, Pfeiffer.

Plate 10, figures 15, 16, 18.

Shell depressed, subdiscoidal, finely ribbed above, smooth beneath, upper surface a little convex; whorls 5, with slightly depressed suture; body whorl deflected, much constricted and scrobiculate behind the aperture; aperture small, lip thick, much expanded, its extremities joined by a callus forming an irregular, flexuose, V-shaped tooth, its point extending far within the aperture; lip with two stout basal folds converging within, while behind them is a perpendicular broad laminae almost entirely closing the mouth; base convex, showing more than one whorl with a rounded umbilical groove terminating in a minute oblique central perforation. Transparent white, shining.

Diam. 12, height 5 mill.

Tamaulipas, Mexico.

††† *Outer teeth tubercular, swelled, placed behind the parietal tooth.*

‡ *Shell, smooth below.***14. Dædalochila Dorfeuilliana, Lea.**

Plate 10, figures 20, 21.

Obtusely conical above and slightly angulated on the periphery; whorls 6, with well impressed suture, ribbed, smoother below, deflected and constricted behind the aperture but without scrobiculations. Aperture lunar, the extremities of the lip joined by a callus forming a quadrate tooth on the outer whorl, far within, behind the parietal tooth, are two rounded tubercles, one superior and one basal, of nearly equal size; base showing $1\frac{1}{2}$ whorls and a minute perforation. Whitish.

Diam. 7.5, height 4 mill.

Kentucky and Tennessee. Texas?

15. *Dædalochila Jacksoni*, Bland.

Plate 10, figures 32, 33, 34.

Depressed, striate, smoother beneath, narrowly umbilicate; whorls 8, slightly convex, deflected, and contracted behind the lip; aperture oblique, lunate, lip thick, briefly reflected, its extremities joined by a V-shaped parietal tooth, basal margin with a strong, oblique sinuous fold, right margin with a deeply seated tooth. Dark brown, shining, lip brownish.

Diam. 7, height 4 mill.

Fort Gibson, Indian Territory.

Fig. 32 represents an elevated variety.

16. *Dædalochila fastigans*. L. W. Say.

Plate 10, figures 22, 23, 24.

Convex beneath, nearly plane above; whorls 6, ribbed above, smooth beneath, periphery sharply carinated; aperture lunate the extremities of the margin connected by a V-shaped tooth, upper lip tooth compressed, transverse, situated remote from the margin, lower lip tooth compressed, marginal, the position of the two being marked by pits in the outer surface of the whorl. Brownish.

Diam. 8, height 3 mill.

Tennessee.

†† *Shell striate below.*

17. *Dædalochila Troostiana*, Lea.

Plate 10, figures 19, 25.

Differs from *D. fastigans* by its less prominent carina, the rib-like striæ being well developed on the base and its parietal tooth more quadrangular. The spire is slightly, convexly elevated. Corneous when fresh, minutely hirsute.

Diam. 6, height 3 mill.

Tennessee.

18. Dædalochila Hazardi, Bland.

Plate 10, figures 27, 28, 29.

Depressed above, convex below; whorls 5, narrow, ribbed above and below, periphery not carinate, aperture sub-reniform; lip-extremities connected by a V-shaped parietal tooth, lip teeth deep-seated, the lower one the largest and partly obscuring the upper one, which is situated farther in; externally scrobiculate opposite to these teeth. Epidermis sparingly hirsute, brown.

Diam. 7, height 3 mill.

Kentucky, Tennessee, Georgia, Alabama.

Distinguished from *Troostiana* by not being carinate, and by the lower tooth, which runs blade-shaped into the aperture a short distance.

††† *Two parietal lamellar teeth running within the shell.***Dædalochila? hippocrepis, Pfeiffer.**

Plate 10, figure 42.

Shell heavy, depressed, opaque, with flattened spire and impressed suture; whorls $5\frac{1}{2}$, scarcely convex above; periphery angulate below, convex, abruptly reflected at the aperture and constricted behind the lip; umbilicus expanded and grooved, with a minute central perforation; aperture extending from the periphery to the umbilicus, somewhat ear-shaped, lip white, expanded, its extremities connected by a V-shaped tooth, the two laminae of which run far within the shell; upper portion of the lip with an entering angle, basal portion callous and reflected.

Diam. 12, height 5 mill.

New Braunfels, Texas.

HELICIDÆ.

SYNONYMY AND REFERENCE TO
PLATE 7.

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 SYNONYMY AND REFERENCE TO
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MESODON.

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HELICIDÆ.

SYNONYMY AND REFERENCE TO
PLATE 9.

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Bland, l. c. vii., p. 433, 1862. No. 4.

See also fig. 7.

TRIODOPSIS.

- Fig. 5. T. INTROFERENS, Bland. Ann. N. Y. Lyc.
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- " 6, 13. T. TRIDENTATA, Say. Nicholson's Encyc.,
iv., t. 2, f. 1, 1816.
Binney, Terr. Moll., ii., p. 183, *part*, t. 27,
1851.
W. G. Binney, l. c. iv. p. 70, 1859.
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XOLOTREMA.

- " 7, 11. X. APPRESSA, Say. Jour. Acad. Nat. Sci.,
ii., p. 154, 1821.
Binney, Bost. Jour. Nat. Hist., iii., p. 356,
t. 8, July, 1840.
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W. G. Binney, l. c. iv., p. 59, 1859.
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H. linguifera, Lamarek. Anim. S. vert. vi., p.
90, 1822. No. 5.

ISOGNOMOSTOMA.

- " 8. I. RUGELI, Shuttleworth. Diagnosen neuer
Mollusken, No. 2, p. 18.
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W. G. Binney, l. c. iv., p. 60, t. 78, f. 15,
1859.
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- " 9. T. HOPETONENSIS, Shuttleworth. Bern. Mit-
theil, p. 198, 1852.
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- Binney, Terr. Moll., ii., p. 143, t. 45, f. 3,
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- Fig. 12. *T. FALLAX*, Say. Jour. Acad. Nat. Sci., ii.,
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- " 14. *T. VULTUOSA*, Gould. Proc. Bost. Soc. Nat.
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- " 15. *T. MULLANI*, Bland and Cooper. Ann. N. Y.
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17, June, 1861. No. 7.
- " 16, 19. *T. LORICATA*, Gould. Proc. Bost. Soc. Nat.
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H. Lecontei, Lea. Trans. Am. Philos. Soc., x.,
p. 303, t. 30, f. 13, 1852. No. 8.
- " 17. *T. YUCATANEA*, Morelet. Testacea nov. Am.
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STENOTREMA.

- " 18, 20. *S. MONODON*, Rackett. Linn. Trans., xiii.,
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Binney, Bost. Jour. Nat. Hist., iii., p. 360,
t. 10, f. 1, Jan., 1840.
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AMERICAN JOURNAL

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viii., p. 112, 1838. No. 1.
- Fig. 21. *S. STENOTREMA*, Ferussac. Pfeiffer, Symb. ad.
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W. G. Binney, l. c. iv., p. 61, 1859.
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- H. hirsuta*, var. Binney. Terr. Moll., ii., p. 151,
t. 42, f. 5, 1851. No. 2.
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lusks, ii., p. 156, t. 40a., f. 3, 1851.
Gould, Moll. Wilkes' Expl. Exped., p. 70, f.
40, a. b. c., 1852.
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- " 24. *S. HIRSUTA*, Say. Jour. Acad. Nat. Sci., i., p.
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t. 10, f. 3, July, 1840.
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1851.
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- " 25. *S. LABROSA*, Bland. Ann. N. Y. Lyc. Nat.
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- " 26, 28, 29. *S. SPINOSA*, Lea. Trans. Am. Philos.
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- H. spinosa*, var., Binney. Terr. Moll., ii., p. 155,
t. 44, f. 2, 1851. No. 7.

- Fig. 31, 35. *S. MAXILLATA*, Gould. Proc. Bost. Soc. N. Hist., iii., p. 38, July, 1848.
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- “ 32, 33. *S. BARBIGERA*, Redfield. Ann. N. Y. Lyc. Nat. Hist., vi., p. 171, t. 9, f. 4, 5, 7, Dec., 1856.
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HELICIDÆ.

SYNONYMY AND REFERENCE TO PLATE 10.

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- Figs. 1, 4. *D. LEPORINA*, Gould, Proc. Bost. Soc. Nat. Hist., p. 39, 1848.
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- “ 2, 3. *D. PUSTULOIDES*, Bland. Ann. N. Y. Lyc. Nat. Hist., vi., p. 350, Feb., 1858.
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H. pustula, Binney. Terr. Moll., ii., p. 201, t. 39, f. 3, 1851. No. 2.

- Fig. 5, 36, 38. D. TEXASIANA, Moricand. Memoires Soc. Genev., vi., p. 538, t. 1, f. 1, 2, 1833.
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H. *pustula*, part, Binney. Terr. Moll., ii., p. 201, 1851. No. 3.
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- “ 19, 25. D. TROOSTIANA, Lea. Trans. Amer. Philos. Soc., vi., p. 107, t. 24, f. 119, 1838.
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Fig. 20, 21. *D. DORFEUILLIANA*, Lea. Trans. Amer.
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4, 1851.

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No. 7.

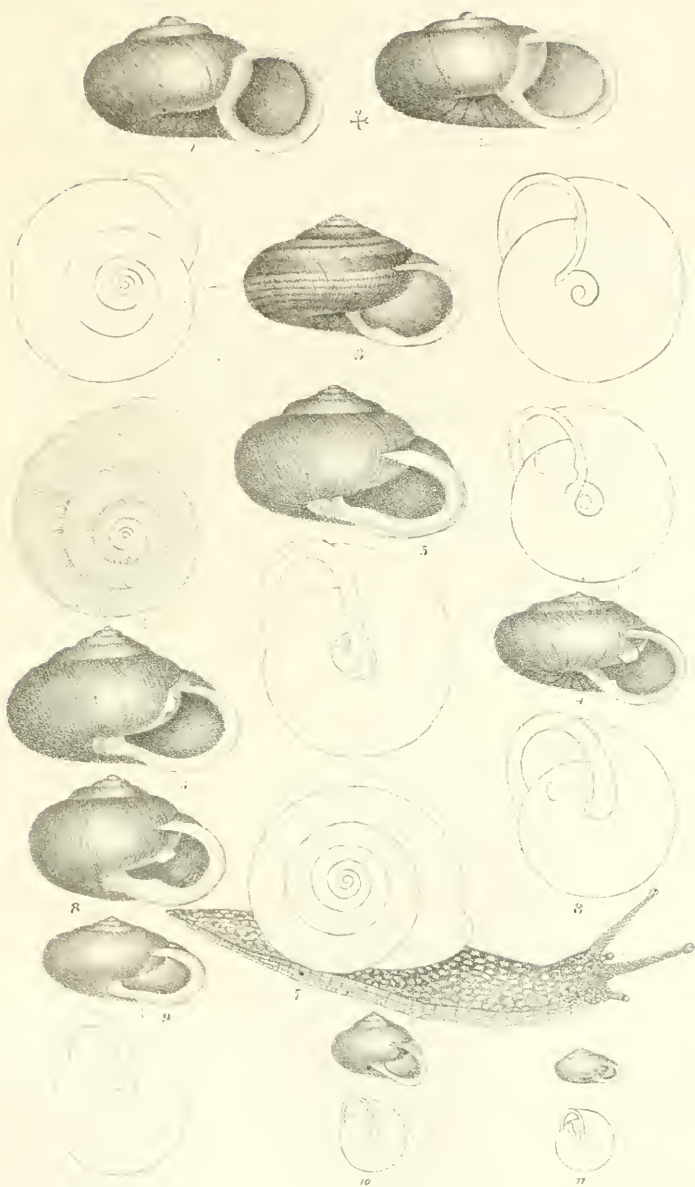
- Fig. 27, 28, 29. D. HAZARDI, Bland, Ann. N. Y. Lyc.
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- H. fatigiata*, Binney, Bost. Jour. N. Hist.,
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- H. Terasiana*, Pfr., Monog. Hel., i., p. 418,
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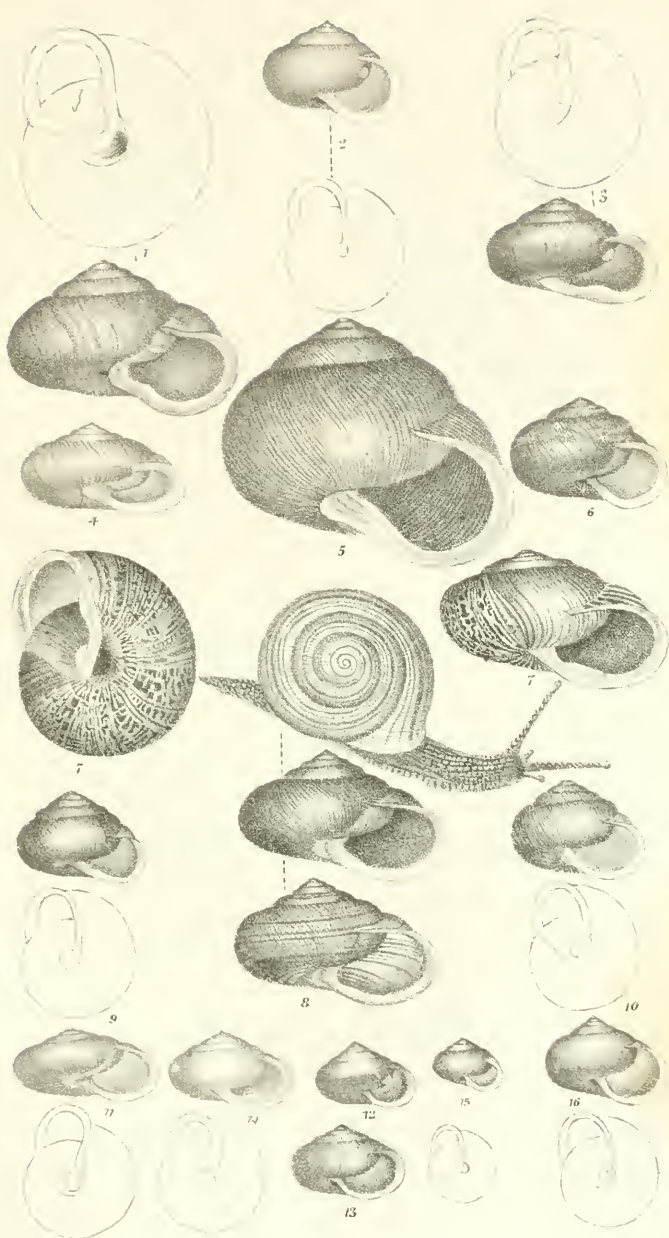
POLYGYRA.

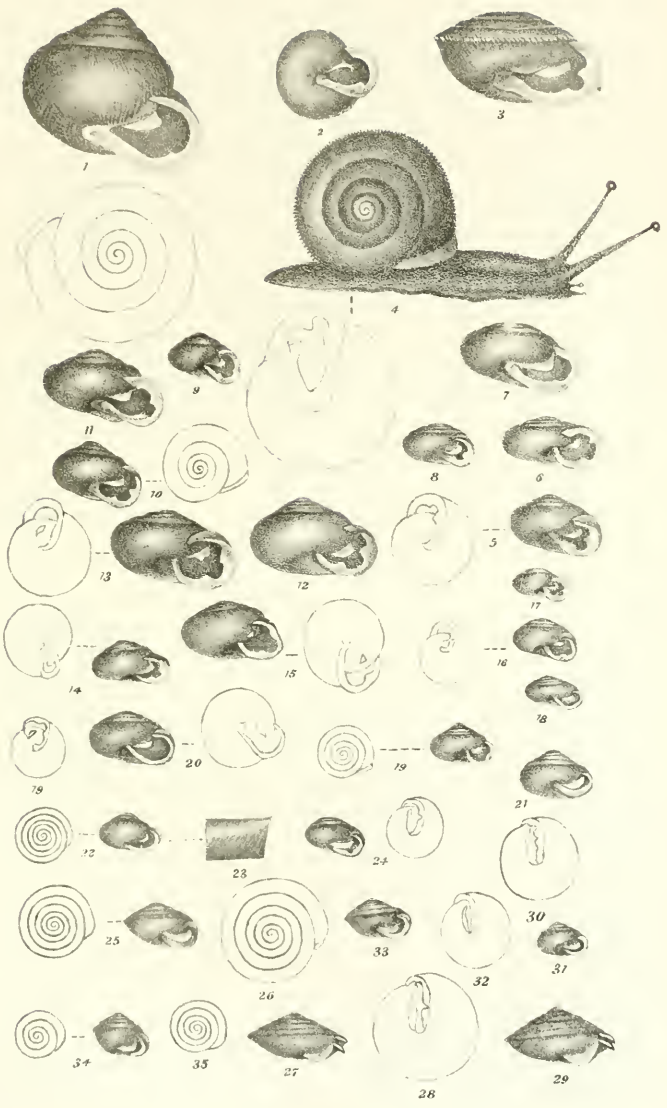
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- " 42. D. HIPPOCREPIS, Pfeiffer. Roëmer's Texas, p.
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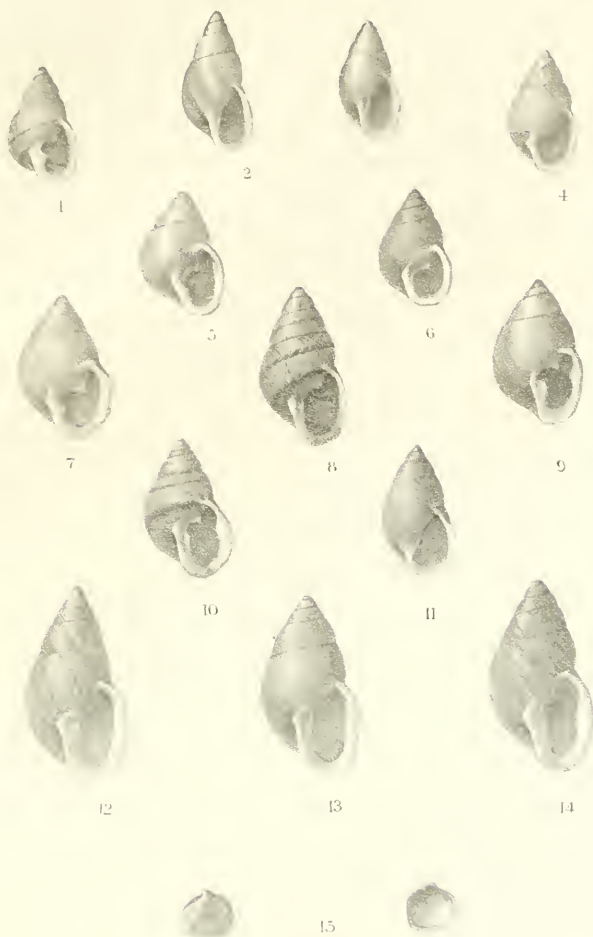


Fig. 1. *Partula trilincata*, Pease

" 2. " *elongata*, ..

" 3. " *gracilis*, ..

" 4. " *striolata*, ..

" 5. " *rustica*, ..

" 6. " *crassilabrum*, ..

Fig. 7. *Partula umbilicata*, ..

" 8. " *verillum*, Pease

" 9. " *compacta*, ..

" 10. " *bilincata*, ..

" 11. " *sumilans*, ..

" 12, 13, 14. " *variabilis*, ..

Fig. 15. *Montacuta Gouldi*, Thomson.

ILLUSTRATIONS OF NEW SPECIES OF PARTULA.

*Described by WM. HARPER PEASE, in American Journal of Conchology,
Vol. II., p. 193, et seq., 1866.*

PLATE I.

Fig. 1. *P. TRILINEATA*, Pease, Am. Jour. Conch. II., p. 195,
1866.

Fig. 2. *P. ELONGATA*, Pease, id., p. 196.

“ 3. *P. GRACILIS*, Pease, id., p. 197.

“ 4. *P. STRIOLATA*, Pease, p. 197.

“ 5. *P. RUSTICA*, Pease, id. p. 199.

“ 6. *P. CRASSILABRUM*, Pease, id., p. 199.

“ 7. *P. UMBILICATA*, Pease, id., p. 200.

“ 8. *P. VEXILLUM*, Pease, id., p. 198.

“ 9. *P. COMPACTA*, Pease, id., p. 200.

“ 10. *P. BILINEATA*, id., p. 201.

“ 11. *P. SIMULANS*, Pease, id., p. 202.

“ 12. *P. VARIABILIS*, Pease, id., p. 203.

NOTICES AND REVIEWS OF NEW WORKS.

BY GEO. W. TRYON, JR.

I.—AMERICAN.

Memoirs of the Boston Society of Natural History. 4to., Vol. I.
Part I. 1866.

Enumeration of Fossils collected in the Niagara Limestone, at Chicago, Illinois; with Descriptions of several New Species. BY PROF. ALEXANDER WINCHELL AND PROF. OLIVER MARCY.

<i>Strophomena macra.</i>	<i>Pleurotomaria sigaretoides.</i>
“ <i>Niagarensis.</i>	<i>Platyceras campanulatum.</i>
<i>Streptorynchus hemiaster.</i>	<i>Holopea Niagarensis.</i>
<i>Spirifera similior.</i>	“ <i>Chicagoensis.</i>
<i>Pentamerus Chicagoensis.</i>	<i>Subulites brevis.</i>
<i>Pterinea volans.</i>	<i>Bellerophon perforatus.</i>
“ <i>revoluta.</i>	<i>Gomphoceras Marcyæ.</i>
“ <i>cyrtodontoides.</i>	<i>Lituities Hercules.</i>
<i>Clidophorus McChesneyanus.</i>	<i>Gyroceras Bunnisteri.</i>
<i>Edmondia Nilesi.</i>	<i>Conocardium ornatum.</i>
<i>Conocardium Niagarensis.</i>	<i>Porcellia senex.</i>
<i>Pleurotomaria gonopleura.</i>	

Proceedings of the California Academy of Natural Sciences. III.
Part 3.* 1866.

Descriptions of New Marine Shells from the Coast of California. Part 3. BY PHILIP P. CARPENTER.

* Review continued from American Jour. Conch., I., pp. 175, 356.
1865.

<i>Corbula luteola.</i>	<i>Ethalia supravallata.</i>
<i>Plectodon</i> , n. gen.	“ var. <i>invallata.</i>
“ <i>scaber.</i>	<i>Galerus contortus.</i>
<i>Macoma indentata.</i>	<i>Cæcum crebricinctum.</i>
<i>Cooperella</i> , n. sub. gen.	“ <i>Cooperi.</i>
“ (<i>Oedalina</i>) <i>scintillæ-</i>	<i>Turritella Cooperi.</i>
“ <i>formis.</i>	? <i>Mesalia tenuisculpta.</i>
<i>Semele incongrua.</i>	<i>Isapis obtusa.</i>
<i>Psephis salmonæa.</i>	<i>Rissoina interfossa.</i>
<i>Astarte fluctuata.</i>	<i>Rissoa acutellirata.</i>
<i>Cardium</i> ? (<i>modestum</i> var.)	<i>Fenella pupoidea.</i>
“ <i>centifilosum.</i>	<i>Amphithalamus</i> ? <i>lacunatus.</i>
<i>Lepton meroëum.</i>	<i>Diala acuta.</i>
<i>Pristiphora</i> (for <i>Pristis</i> preoc.)	“ <i>marmorea.</i>
“ <i>oblonga.</i>	<i>Styliferina turrita.</i>
<i>Leda hamata.</i>	<i>Jeffreysia translucens.</i>
<i>Acanthochites avicula.</i>	<i>Cythna albida.</i>
<i>Acanthopleura fluxa.</i>	<i>Chrysallida pumila.</i>
<i>Ischnochiton veredenticus.</i>	“ <i>cincta.</i>
<i>Lepidopleurus pectinatus.</i>	<i>Chemnitzia chocolata.</i>
“ <i>scabricostatus.</i>	“ <i>subcuspidata.</i>
<i>Ischnochiton</i> , nov. s. g. <i>Trachydermon.</i>	<i>Eulima</i> (? var.) <i>compacta.</i>
<i>Trachydermon Gothicus.</i>	“ (? var.) <i>rutila.</i>
<i>Leptochiton nexus.</i>	<i>Scalaria bellastrata.</i>
<i>Nacella</i> (? <i>pallucea</i> , var.) <i>tri-</i>	“ <i>subcoronata.</i>
“ <i>angularis.</i>	“ <i>crebricostata.</i>
<i>Nacella subspiralis.</i>	<i>Opalia spongiosa.</i>
<i>Acmaea</i> (? <i>pileolus</i> , var.) <i>rosacea.</i>	“ <i>retiporosa.</i>
<i>Scurria funiculata.</i>	<i>Nassa inculpta.</i>
<i>Puncturella Cooperi.</i>	<i>Amycla chrysalloidea.</i>
<i>Gibbula optabilis.</i>	<i>Anachis subturrita.</i>
<i>Calliostoma supragranosum.</i>	<i>Trophon triangulatus.</i>

Note on Octopus punctatus, Gabb. BY W. H. DALL.

Description of a New California Helix, with notes on others already described. BY J. G. COOPER, M. D.

Helix (Arianta) sequoicola.

On a New Subfamily of Fluvial Mollusca. BY W. H. DALL.

Pompholinx for Pompholyx effusa.

Journal of the Academy of Natural Sciences of Philadelphia. New series. VI., Part 1. 4to. July, 1866.

New Unionidae, Melanidae, etc., chiefly of the United States.
BY ISAAC LEA.

This fine paper contains the full description and remarks upon a large number of new species, the Latin diagnoses of which were published in the Proceedings of this Society principally during the years 1862—63. The names and localities of most of these species we have already given in former reviews. The descriptions are now accompanied by illustrations of a very superior character.

A large addition is made in the present paper to the Molluscous fauna of North Carolina, in the description of over twenty new species, (mostly, as heretofore, belonging to the great *complanatus* group,) native to that State; there are also a few *Anodonta* from various localities, the *Unionidae* collected by the Nyassa (Central African) Expedition, and species from the Southern United States, and from the river Tigris, in Assyria. The paper is not concluded in the present issue of the Journal.

The following is a list of the species geographically arranged:—

British America. *Anodonta Dallusiana*.

Pennsylvania, Connecticut, Massachusetts. *Anodonta Tryonii*.

Virginia. *U. Chathamensis*, *Anodonta Williamsii*, *A. Tryonii*.

North Carolina. *Unio quadrilaterus*, *U. Raleighensis*, *U. aberrans*, *U. pertenuis*, *U. Charlottensis*, *U. lucidus*, *U. viridulus*, *U. Weldonensis*, *U. nassutululus*, *U. oblatulus*, *U. Livingstonensis*, *U. indefinitus*, *U. perlatus*, *U. Waccamawensis*, *U. Mecklenbergensis*, *U. perlucens*, *U. cistellæformis*, *U. Gastonensis*, *U. Chathamensis*, *U. squalidus*, *U. curatus*, *U. mediocris*, *Anodonta doliaris*.

South Carolina. *U. quadrilaterus*.

Georgia. *Anodonta Williamsii*, *Unio crapulus*, *U. parvulus*.

Alabama. *Unio Thorntonii*, *U. Mooresianus*, *U. mundus*, *U. crebrivittatus*, *U. parvulus*, *U. biemarginatus*, *U. granulatus*, *U. germanus*.

Texas. *Anodonta Leonensis*, *A. Bealei*.

Tennessee. *Unio tessurulus*, *U. perpurpureus*.

Michigan. *U. Leibii*.

Asia Minor. *Unio rarus*, *U. dignatus*, *U. Mosulensis*, *U. Oronatesensis*, *U. Bourguignatianus*, *U. Damascensis*, *U. Syriacus*, *U. delicatus*.

India. *Unio tripartitus*.

Siam and China.* *Monocondylæa compressa*, *Unio Pazzi*, *U. Laosensis*, *Monocondylæa Mouhotiana*.
 Central Africa. *Unio Kirkii*, *U. Nyassaensis*, *U. Aferulus*,
Spatha alata, *S. Nyassaensis*, *S. modesta*.
 South Africa. *Unio Natalensis*, *Spatha Natalensis*.
 New South Wales. *Unio Paramattensis*.

Proceedings of the Academy of Natural Sciences of Philadelphia.
 No. 2. For April and May, 1866.

Description of Five New Species of the Genus Unio. BY
 ISAAC LEA.

<i>Unio Siamensis</i> ,	Siam.
“ <i>asperulus</i> ,	“
“ <i>pilatus</i> ,	“
“ <i>evittatus</i> ,	Bengal.
“ <i>Strebelii</i> ,	Vera Cruz, Mexico.

Description of Two New Species of the Genus Lithasia.
 BY ISAAC LEA.

<i>Lithasia cylindrica</i> ,	Coosa River, Alabama.
“ <i>Wheatleyi</i> ,	Cahawba “ “

No. 3. June, July and August, 1866.

*Contributions to the Paleontology of Illinois and other
 Western States.* BY F. B. MEEK AND A. H. WORTHEN.

<i>Pteria Morganensis.</i>	<i>Anomphalus</i> , n. g., (<i>Rotellidae</i>).
<i>Dolabra Sterlingensis.</i>	<i>Anomphalus rotulus</i> .
<i>Macrodon micronema.</i>	<i>Microdoma</i> , n. g., (<i>Littorinidae</i> ?)
<i>Platyceras levigatum.</i>	“ <i>conica</i> .
“ <i>haliotoides</i> .	<i>Orthonema conica</i> .
“ <i>uncum</i> .	<i>Trochita</i> ? <i>carbonaria</i> .
“ <i>Chesterense</i> .	<i>Platyschisma helicoides</i> , Sowerby?
“ <i>subplicatum</i> .	<i>Pleurotomaria conoides</i> .
“ <i>infundibulum</i> .	“ <i>Corana</i> .
<i>Metoptoma (Platyceras?) umbella</i> .	“ <i>spironema</i> .
	“ <i>Valvatiformis</i> .
<i>Polyphemopsis chrysallis</i> .	<i>Murchisonia inornata</i> .
<i>Naticopsis Littonana</i> , var.,	<i>Nautilus sulcatus</i> , Sowerby?
<i>Genevieveensis</i> .	“ <i>Rockfordensis</i> .

* Mr. Lea remarks of *U. Pazzi*, “It will be observed that two habitats (China and Siam) are given. I think it probable that they are from China only.” I have specimens labelled “Cambodia,” and received from Mr. B. M. Wright, a well-known dealer of London. I do not think it will be found in China, as it belongs to a Siamese type of the genus.

Monograph of American Corbiculadæ, (Recent and Fossil.) By TEMPLE PRIME. 8vo. 50pp. Smithsonian Institution, Washington. December, 1865.

We have more than once acknowledged with gratitude, in these pages, the prominent share which the Smithsonian Institution is taking in rendering the study of American Conchology accessible to all who take an interest in its pursuit. The present issue, which is the first of a series which will include, when completed, the entire Molluscan fauna of the United States, contains the history of all the small fluviatile bivalves which, under the generic names of *Sphaerium* (*Cyelas*) and *Pisidium*, are found in all the temperate regions of the continent, as well as of their larger prototypes the species of *Corbicula* and *Cyrena* inhabiting its tropical portions. It may be truly said that this family has never been studied in America, save by the author of the above work, and that the characters of the species are almost utterly unknown to us. These shells are so minute, and their study, without the advantage of good figures in identifying them, so unsatisfactory, that conchologists have been tempted to neglect them for fields yielding a richer harvest. As this monograph is the product of the ripe judgment and experience of a gentleman who has spent his entire leisure for years in becoming thoroughly acquainted with his subject, it may fairly be presumed that his views of the synonymy of the species, etc., are correct—and, at any rate, no one is competent to call them in question. We will therefore content ourselves with a rapid summary of the work, in order that our readers may estimate its importance to those who will doubtless hereafter give more particular attention to the subject of which it treats. In the preface, Mr. Prime states that the American species of *Corbicula* differ from the foreign ones in the pallial impression being terminated in a sinus, whereas in the latter it is simple, and that the same distinction holds good between the American and the foreign species of *Cyrena*; yet three fossil species of *Corbicula* from the Paris basin exhibit the sinus the same as in our recent species. As these differences indicate structural differences in the animals, Mr. Prime proposes at a future time to characterize as new genera the American *Corbiculæ* and *Cyrenæ*.

The genus *Sphaerium*, Mr. Prime thinks, might be advantageously divided into four genera, to include those with

“ 1. Shell solid, striæ deep, beaks rounded; example *Sph. sulcatum*: *Sph. solidum* of Europe.

2. Shell somewhat solid, striæ light, beaks rounded; example *Sph. rhomboideum*; *Sph. corneum* of Europe.

3. Shell delicate and pellucid, striæ not perceptible, beaks calyculate; example *Sph. partumeium*; *Sph. lacustre* of Europe.

4. Shell very small, delicate, transverse, striæ very light, beaks calyculate; example *Sph. Bahiense*; *Sph. Africanum* of South Africa."

Following the preface is a Systematic Index of the species described, amounting to one hundred and eleven, including the fossil ones. Of these, thirteen, principally South American, belong to the genus *Corbicula*; there are thirty-six species of *Cyrena*, of which two or three recent, and two fossil species are found in the United States, the rest in Mexico, Central and South America and West Indies; of *Sphaerium* there are forty-four species, nearly all natives of the northern United States; and, finally, *Pisidium* contains eighteen species, with the same distribution.

The following species are described for the first time:—

Corbula perplexa, South America.

Cyrena regalis, South America?

" *ordinaria*, " ?

" *colorata*, Island of New Providence, West Indies.

Sphaerium contractum, Alabama.

" *parvulum*, Porto Rico, W. I.

" *viridante*, Morelot, Gaudeloupe, W. I.

" *Cubense*, Cuba.

Pisidium simile, Gaudeloupe, W. I.

" *ultramontanum*, Canoe Creek, California.

" *consanguineum*, Cuba.

The name of *Cyrena tumida* is substituted for *C. angulata*, Deshayes, (preoccupied).

The illustrations of the species (wood engravings) are excellent and all that could be desired for the purposes of identification. We cannot close this notice without deprecating the too prevalent practice, which Mr. Prime has followed, of quoting for the species the name proposed for it by the first author who placed it in the genus to which it is now referred. The consequence of this is that, in several cases, old and well-known specific names are cast aside and others substituted. Besides the manifest injustice thus committed towards the discoverer of the species, this principle is gravely faulty, in substituting for one permanent specific name an appellation that must ever change with each change in our ideas of classification. Genera as understood by scientific men are eminently artificial, and therefore can have no permanent limits, but are liable to be divided and combined in various ways according to the views we take of them; shall we then lose the only sign-post by which to recognize a species, by changing its

name and authority with each new genus into which it may be thrust? If so, in a very little while no man would be found bold enough to enter into a study in which, even now, the synonymy is almost interminable.

II.—FOREIGN.

BRITISH.

Annals and Magazine of Natural History. Third Series, Vol. 17. 8vo., London, 1866.

No. 97. JANUARY.

On the Terrestrial and Fluvial Mollusca of Trinidad.
By R. J. LECHMERE GUPPY.

Ampullaria urceus, Müll., var. *purpurascens*, Guppy, formerly described as a distinct species, (Ann. and Mag., xiv. p. 243.)

Helicina nemoralis is proposed instead of *H. zonata*, Guppy, described at same time and preoccupied.*

Helicina barbata, Guppy, is possibly only a variety of *H. Dysoni*, Pfr.

Bulinus multifasciatus, Lam., nov. var. *imperfectus*.

“ *aureolus*, nov. spec.

Plekocheilus auris-sciuri, nov. spec.

Simpulopsis corrugatus, “ “

Conulus (Helix) vacans, “ “

Anodon Leolandi, “ “

All the other species inhabiting the island are enumerated, with remarks. The curious feature of this paper is the record of the discovery of a new species of Unionidæ in the West Indies.

No. 98. FEBRUARY.

Conchological Gleanings. By DR. E. VON MARTENS.

I. On the subdivisions of the genus *Pinna*.

No. 99. MARCH.

Conchological Gleanings. By DR. E. VON MARTENS.

II. On some species of *Assiminea*.

Assiminea pinguis, Makao.

“ *miniata*, Singapore.

Omphalotropis maculata, Martens, is said to be a synonym of *Assiminea carinata*, Lea.

* Mr. Bland suggests to me that it is probably the same as *H. McMurrayi*, Pfr., Mal. Blatt., 1862, p. 155; and Novitates Conchol., pl. 64, figs. 15-16.

III. The Sandwichian species of *Limnæus*.

IV. On the species of *Amphipeplea*.

No. 100. APRIL.

On the Pleistocene Fossils collected by Col. E. Jewett at Sta. Barbara, (California;) with Descriptions of New Species.
BY PHILIP P. CARPENTER.

<i>Turritella Jewettii.</i>	<i>Opalia</i> (? <i>crenatoides</i> , var.) <i>in-</i>
<i>Bittium</i> ? <i>asperum</i>	<i>sculpta.</i>
“ <i>armillatum.</i>	<i>Trophon tenuisculptus.</i>
	<i>Pisania fortis.</i>

On the Float of the Ianthine. BY DR. H. LACAZE DUTHIERS. (Translated by W. S. DALLAS.)

No 104. AUGUST.

On the Morphology and Affinities of the Brachiopoda. BY H. LACAZE DUTHIERS.

Transactions of the Linnean Society of London. xxv., pt. 2, 4to. London, 1865.

On the Anatomy of Doridopsis, a Genus of the Nudibranchiate Mollusca. BY ALBANY HANCOCK.

The author finds but one part of the anatomy of this mollusk to differ from *Doris*; it has a proboscis fitted for suctorial action, while *Doris* possesses a powerful buccal organ and spiny prehensile tongue. He is surprised to find that such an important modification of the alimentary system is not accompanied with corresponding changes of the internal economy of the animal.

The paper is well illustrated.

Proceedings of the Zoological Society of London. Part III. June-December. 1865.

On the Marine Molluscan Fauna of the Province of South Australia; with a List of all the Species known up to the present time; together with Remarks on their Habitats and Distribution, &c. BY GEORGE FRENCH ANGAS. (Part 2.)

Descriptions of Seven New Species of the Genus Vivipara Link. BY GEORGE RITTER V. FRAUENFELD.

<i>V. Sclateri</i> , Japan.	<i>V. Jeffreysii</i> , Lake Nyassa.
“ <i>Siamensis</i> , Siam.	<i>V. capillata</i> , “ “
“ <i>heliceformis</i> , Cent. Africa.	<i>V. Robertsoni</i> , “ “
“ <i>punctata</i> , West Africa.	

Descriptions of seven new species of Australian Land Shells.

BY JAMES C. COX, M. D.

<i>Helix aridorum.</i>	<i>Helix splendescens.</i>
" <i>flosculus.</i>	" <i>nautiloides.</i>
" <i>Urarensis.</i>	<i>Vittrina planilabris.</i>
" <i>Greenhilli.</i>	

Descriptions of Two New Species of Marine Bivalve Shells, from South Australia. BY GEORGE FRENCH ANGAS.

<i>Barbatia laminata.</i>	<i>Spisula Adelaideæ.</i>
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Descriptions of a New Genus and some New Species of Mollusks. BY HENRY ADAMS.*Macron Wrightii.* Coast of Patagonia.*Eglisia Macandreeæ,* Gibraltar.*Amphithalamus obesus,* Lord Hood's Island." *pupoides,* " "*Heterocardia Dennisoni,* Loc. ?*Thyella,* (new genus, closely allied to *Semele*.)*Thyella pulchra,* Singapore.

Macron, hitherto considered a subgenus of *Pseudoliva*, is now separated as a distinct genus, as its operculum is unguiculate, while that of *Pseudoliva* is purpuroid.

Descriptions of Thirteen New Species of Land Shells from Formosa, in the collection of the late Hugh Cuming, collected by Mr. Robert Swinhoe, Vice-Consul of that Island. BY DR. LOUIS PFEIFFER.

<i>Helix Vesta.</i>	<i>Helix mellea.</i>
" <i>Shermani.</i>	<i>Bulimus Swinhoei.</i>
" <i>Granti.</i>	" <i>spharoeonus.</i>
" <i>Swinhoei.</i>	" <i>incertus.</i>
" <i>Formosensis.</i>	<i>Clausilia Swinhoei.</i>
" <i>bacca.</i>	" <i>Sheridani.</i>
	<i>Pterocyclos Wilsoni.</i>

Descriptions of Five New Species of Land Shells from the collection of the late Hugh Cuming. BY DR. LOUIS PFEIFFER.

<i>Bulimus auris,</i> Venezuela.	<i>Pseudachatina elongata,</i> Gaboon
" <i>tenuilabris,</i> "	River.
" <i>Juarezi,</i> Mexico.	<i>Achatina Calabarica,</i> Old Calabar.

Proceedings of the Zoological Society of London. Part I. January-March. 1866.

Notes on some Recent Brachiopoda dredged by the late Lucas Barrett off the Northeast Coast of Jamaica, and now forming part of the Collection of Mr. R. Mac Andrew.
By THOMAS DAVIDSON.

Argiope Barretiana, Jamaica.

“ *Woodwardiana*, Jamaica.

Thecidium Barrettii, Woodward, MS., Jamaica.

Additional list of Mollusks collected by Mr. R. SWINHOE, in Formosa.

Descriptions of a New Genus and a New Species of Mollusks. By HENRY ADAMS.

Brotia N. G. Type *Melania pagodula*, Gould.

This shell belongs to the family *Cerithiidae*.

Colina gracilis, Eastern Seas.

The Naturalist in Vancouver Island and British Columbia. By JOHN K. LORD. 2 vols., 8vo. London. 1866.

In the appendix is a list of the shells collected, and among them the following are described as new. (A part at least of these species have been already published in the Proceedings of the Zoological Society, London.)

<i>Chrysodomus tabulatus</i> ,	Baird.	<i>Physa Lordi</i> ,	Baird.
<i>Vitularia aspera</i> ,	“	<i>Ancylus Kootaniensis</i> ,	“
<i>Chemnitzia Vancouver-</i>		<i>Chione Lordi</i> ,	“
<i>censis</i> ,	“	<i>Sphcerium tumidum</i> ,	“
<i>Amnicola Hindsii</i> ,	“	<i>Lyonsia saxicola</i> ,	“
<i>Bullina eximia</i> ,	Lord.	<i>Leda fossa</i> ,	“
<i>Succinea Hawkinsii</i> ,	Baird.	<i>Crassatella Esquimalti</i> ,	“
<i>Lymnea Sumassi</i> ,	“	<i>Nucula Lyalli</i> ,	“

Conchologia Iconica. By LOVELL REEVE. Parts 256, 257.

Pyrazus, 1 plate; May, 1865.

Lampania, 2 plates; May, 1866.

Cerithiidea, plates 3, 4, completing the monograph;
May, 1866.

Tympanotonos, 2 plates; May, 1866.

Leiostraca, 2 plates; May, 1866.

The following are new :—

L. acutissima, Sydney Harbor, New South Wales.

“ *pyramidalis*, Habitat ?

“ *subventricosa*, “ ?

“ *vineta*, “ ?

Niso, 1 plate ; May, 1866.

N. Sandwichensis, Sandwich Islands.

Potamides, 1 plate ; May, 1866.

Unio, plates 39 to 42 ; May, 1866.

The locality of *Unio ziezac* is erroneously given as “South Carolina.” It is a northwestern species. *U. ligamentinus*, Lamarck, is made a synonym of *U. crassus*, Say, although the former was the first described. In describing *Unio infucatus*, reference is made to “Conrad, Shells of New South Wales” instead of “New Fresh Water Shells,” a piece of carelessness such as we have too often noticed in the Conchologia. *Unio Nyassæ*, described by Sowerby in this work as a new species, is the same as *U. Nyassaensis*, Lea, Proc. Acad. Nat. Sciences, p. 109, 1864, and illustrated on plate 13, fig. 33, of the 6th vol. of their “Journal.”

The new species are

Unio Cambojensis, Sowerby, Cambodia.

“ *Swinhoei*, Reeve MS. “

Conchologia Iconica. By Lovell Reeve. Parts 258, 259.

Tellina, 10 plates. July and August, 1866.

The following is new :—

T. subtrigona, Sowerby.

Pleiodon, 2 species.

Mr. Conrad, in the present number of our Journal, separates his *P. Murtrei* from the synonymy of *P. ovatus*.

Unio, plates xliii. to xlvi. inclusive ; August, 1866.

No new species are described. Sp. 235. “*Unio ventricosus Barnes*” is *Unio capax*, Green.

U. tenuissimus, Lea, is figured from a male specimen, and the description does not include the very curious female shell.

U. Gundlachii, Dunker, is described without locality and figured from a poor specimen. The locality is Cuba. *U. scamnatus*, Morelet, is the male form of the same species.

FRENCH.

Journal de Conchyliologie. Third series. Vol. VI., No. 4. October, 1865.

Anatomie des Fistulanes. By P. FISCHER.

Note complémentaire sur le Lygia deliciosa et son opercule.
By H. CROSSE and E. MARIE.

Note sur deux espèces terrestres de Cochinchine. By W. T. BLANFORD.

This gentleman refers to the genus *Nanina* the shells described in this Journal under the names of *Zonites Benoiti* and *Helix Annamitica*, remarking that the genus *Zonites* does not exist in middle Asia.

Description de dix espèces nouvelles de Mollusques terrestres de l'Archipel de Madère. By THE BARON DE CASTELLO DE PAIVA.

<i>Achatina Lowei.</i>	<i>Helix Gomesiana.</i>
<i>Pupa Wollastoni.</i>	" <i>latina.</i>
<i>Pisidium Watsoni.</i>	" <i>Barbozae.</i>
<i>Vitrina Bocagei.</i>	" <i>Luccana.</i>
<i>Helix Pitte.</i>	" <i>Alleniana.</i>

Description d'espèces nouvelles de la République de l'Equateur. By I. GONZALEZ HIDALGO.

<i>Cyclophorus Crosscanus.</i>	<i>Cyclotus Perezi.</i>
<i>Ampullaria Martinezii.</i>	

Note sur les Mollusques operculés terrestres des îles Pelew ou Palaos. By H. CROSSE.

A catalogue of the species is given, consisting of 15 species of the recently described genus *Palaina*, 1 of *Pupina* and 1 of *Omphalotropis*.

Note relative aux genres Arinia et Moussonina. By H. CROSSE.

Description d'espèces nouvelles de la République de l'Equateur. By H. CROSSE.

<i>Cyclophorus Hidalgoi.</i>	<i>Cyclotus Pazi.</i>
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Diagnoses de Bélemnites nouvelles. By CH. MAYER.

<i>B. Stoppanii.</i>	<i>B. mirtus.</i>
" <i>Schlaenbachi.</i>	" <i>Philipsi.</i>
" <i>dactyletron.</i>	" <i>compiler.</i>
" <i>Franconicus.</i>	" <i>Pictaviensis.</i>

<i>B. Harleyi.</i>	<i>B. Munsteri.</i>
" <i>Waageni.</i>	" <i>modestus.</i>
" <i>Heeri.</i>	" <i>Gillieronii.</i>
" <i>avena</i> , Dumortier.	" <i>Privatensis.</i>
" <i>Charmouthensis.</i>	" <i>Picteti.</i>
" <i>bifer.</i>	" <i>Laryi.</i>
" <i>obesulus.</i>	" <i>fusulus.</i>
" <i>recurrens.</i>	" <i>Clucyensis.</i>
" <i>pumilus.</i>	" <i>Fraasi.</i>
" <i>Gundershofensis.</i>	" <i>elegantulus.</i>
" <i>idoneus.</i>	" <i>Merceyi.</i>

Les vulgarisateurs en matiere malacologique. BY H. CROSSE.

This paper is principally a review of and correction of errors in "La Vie et les Mœurs des Animaux Zoophytes et Mollusques," recently published by M. Louis Figuier.

Mollusques terrestres vivantes du Piemont. By the ABBE JOSEPH STABILE. 8vo., 141 pp., and 2 plates. Milan, 1864.

The new species described are :—

Clausilia Mellæ.

Pupa Mortilleti.

Several new varieties of species of *Helices*, etc., are also characterized. A number of pages at the end of the volume are devoted to notes on the modern genera of *Helicidae*, anatomical descriptions, &c.

Revue et Magasin de Zoologie.

No. 2. PARIS, 1866.

Nouvelles Miscellanées Malacologiques. BY DR. PALADILHE (of Montpellier.)

Bugesia Bourguignati.

This is a new minute fresh-water shell, resembling somewhat a very small *Cerithium* or microscopic *Io*,* but differing generically in having a wide, compressed, not callous columella, resembling that of *Lacuna*. *Bugesia* is supposed to belong to the family *Melaniidae*. It attains a length of $1\frac{1}{2}$ millimetres by $\frac{3}{4}$ mill. diam. *Locality*, in washings of the River Lez, near Montpellier, France. This makes the third new genus of minute fresh-

* The genus *Io* is, doubtless, here understood to embrace such species as *Lithasia nupera*, Say, (= *verrucosa*, Raf.) as the magnified figure of *Bugesia* is not very unlike an elongated variety of that species.

water shells discovered in France during the past two or three years, the other two being *Moitessieria* and *Paladilhia* of Bourguignat.

Colimacea in Insula Mauriti de novo reperta. BY ARTHUR MORELET.

<i>Helix Duponti.</i>	<i>Hydrocena major,</i>
<i>Pupa striaticosta,</i>	“ <i>variegata,</i>
“ <i>palangula.</i>	“ <i>clavulus.</i>

No. 3. 1866.

Nouvelles Miscellanées Malacologiques. BY DR. PALADILHE, of Montpellier. (Continued.)

<i>Pupa Masclaryana,</i>	Montpellier.
<i>Paladilhia Bourguignati,</i>	“

There are also notes on various described species inhabiting the same vicinity.

No 5. MAY, 1866.

Diagnoses de Coquilles nouvelles de l'Indo-Chine. PAR M. ARTHUR MORELET.

<i>Helix basodon,</i>	Siam.
<i>Cyclostoma monachus,</i>	Cochin China.
<i>Ampullaria callistoma,</i>	Siam.
<i>Paludina Cochinchinensis,</i>	
“ <i>goniomphalos,</i>	Cochin China.
<i>Anodonta bellua,</i>	Cambodia.
<i>Monocondylus orbicularis,</i>	
<i>Dreissena Siamensis,</i>	Siam.

Nouvelles Miscellanées Malacologiques. BY DR. PALADILHE (Continued.)

Pisidium Moitessieranum, Montpellier (France).

GERMAN.

Fauna der Kieler Bucht. BY H. A. MEYER AND K. MOBIUS. Vol. I. Opisthobranchia. Folio. 26 colored plates. W. Engelmann, Leipzig, 1865.

This is a description of the Opisthobranchiate Mollusca inhabiting the Bay of Kiel. The plates are beautifully drawn and colored, each one representing one species only, with magnified anatomical views, including the dentition. The text is very full, and completely elucidates the history of the species. This work is one of the finest ever issued on the Nudibranchiate Mollusks of Northern Europe. None of the twenty-six species are new.

Malakozologische Blätter. XIII. Cassel, 1865.

This volume contains 208 pages of original contributions and 60 pages of reviews, and is illustrated by 2 plates. The following are the contents :—

Euber die Mexikanischen Binnen-Conchylien aus den Sammlungen von Deppe und Uhde in Berliner Museum. BY DR. EDWARD VON MARRENS.

Glaudina amœna.

Succinea virgata.

Helix implicata.

Many species are remarked upon, and a list of those of the eastern portion of Mexico is also given.

Vergleichende zusammenstellung der Mollusken-faunen der beiden äussersten nordöstlichen und südwestlichen Grenzländer des Politischen Deutschlands. BY AUGUST GYSER.

Zur Mollusken-fauna von Carlsbad und Franzensbad in Böhmen. BY DR. LEHMAN.

Die Mollusken der Dobrudscha. BY DR. L. PFEIFFER.

Succinea Dunkeri,

Zebebor, MSS.

Hyolina Malinowskii,

“ “

Helix Kutschigi,

Parreyss, MSS.

Zwei neue Nacktschnecken aus Australien. BY EMIL SELENKA. (With anatomy.)

Limax pectinatus,

Limax bicolor.

Ueber Pinna fluviatilis Sander. BY O. A. L. MÖRCH.

Ueber Tellina cultriformis, Schulze. BY O. A. L. MÖRCH.

Zur Molluskenfauna von Cuba. BY DR. L. PFEIFFER.

Helix Wrighti,

Gundl.

“ *arctistria.*

Macraceramus maculatus,

Wright, MSS.

Cylindrella clara,

“ “

“ *cristallina,*

“ “

“ *Heynemanni,*

Pfr.

“ *mixta,*

Wright, MSS.

“ *Teneriensis,*

“ “

Diagnosen neuer Landschnecken. BY DR. L. PFEIFFER.

Helix Zoë,

Molluccas.

“ *Gysseriana,*

“

“ *Lorquini,*

“

Bulimus Lehmanni,

Anguila, W. I.

“ *Anguillensis,*

“ “

Helicina Zoë.

Ins. Ialmahera.

“ *guttula*,

Molluccas.

Uebersicht der Mollusken welche bis jetzt an und auf den Capverdischen Inseln gefunden worden sind. BY THEODOR REIBISCH.

Kritische Uebersicht sämtlicher Arten der zur Gattung Venus gehörenden Untergattungen Mercenaria und Gemma. BY DR. EDWARD RÖMER.

Kritische Uebersicht aller Arten der zur Gattung Venus gehörenden Untergattung Gomphina. BY DR. EDWARD RÖMER.

Ueber ostasiatische und newholländische Paludinen. BY EDWARD VON MARTENS.

Contains a critical review of the species contained in Reeve's "Monograph of Paludina," published in "Conchologia Iconica," and the following new species:—

Paludina purpurea. Australia.

Zusätze zu dem Aufsatze über mexikanische Binnen-Conchylien.. BY DR. EDW. VON MARTENS.

Kritische Uebersicht aller Arten der zur Gattung Venus gehörenden Untergattung Anaëtis. BY DR. EDWARD RÖMER.

Nachtrag zu Limax bicolor. BY EMILE SELENKA.

Ueber Helicina viridis, Lam. BY EDWARD VON MARTENS.

Bemerkungen zum vorstehenden Aufsatze. BY DR. L. PFEIFFER.

Beschreibung einer neuen Melanie. BY DR. BROT.

Melania Landaueri. Loc.?

Uebersicht der Land-und Süßwasser-Mollusken des Nil-Gebietes. BY DR. EDWARD VON MARTENS.

Helix (Patula) cryophila, (nov. sp.)

The synonymy of many Egyptian species is given in this first part of the paper.

Malakologische Notizen. BY DR. BERENDT.

(On *Physella Berendti*, *Helix caduca* and *Helix bilineata*.)

Literatur. (Reviews.)

Systematisches Conchilien Cabinet von Martini und Chemnitz.
By H. C. KUSTER, &c. 185th Number. Nurnberg, 1865.

Contains continuation of Monograph of *Achatina* and *Azeqa*, together with an Index to these and the genus *Bulimus*.

The plates are : 1 of *Nautilus*, 1 of *Sepia*, and 4 of *Marginitella*.

Malakozoologische Blätter. Edited by DR. L. PFEIFFER. Vol. 13. 1st to 6th Sheets. Cassel, 1866.

Uebersicht der Land-und Süsswasser Mollusken des Nil-Gebietes. BY DR. EDW. VON MARTENS. (Concluded.)

Beiträge zur Anatomie des Nautilus pompilius. BY WILH. KEFERSTEIN, M. D.

Diagnosen einiger neuen Arten. BY DR. R. A. PHILIPPI, of Santiago, (Chili).

Ancylus Fonckii.

Helix andicola.

Helix Pazi.

Beschreibung neuer Landschnecken von der Insel Formosa,
BY DR. L. PFEIFFER.

Helix Vesta.

Bulimus Swinhoei.

" *Shermani.*

" *sphaeroconus.*

" *Granti.*

" *incertus.*

" *Swinhoei.*

Clausilia Swinhoei.

" *Formosensis,*

" *Sheridani.*

" *bacca.*

Pterocyclos Wilsoni.

" *mellea.*

Beschreibungen und Kritik neuer Mollusken. BY DR. C. AGARDH WESTERLUND.

Vertigo modesta.

Ronneby, Sweden.

Planorbis riparius.

" "

Die Gehausschnecken die Siebenberge. BY A. SPORLEDER.

Zur Molluskenfauna von Cuba. (Continued.) BY DR. L. PFEIFFER.

Helix nigropicta, Arango MSS. *Macroceramus minor,* Arango

" *Sauvallei,* " " " *Arangoi,* Pfr.

" *Luzi,* " " " *Paivanus,* Pfr.

Bulimus (Melaniella) multicos- " *Clerchi,* Arango
tata, Gundl. MSS.

Bulimus (Melaniclla) scalaris *Cylindrella* *Garciana,* Wright
nus, Gundl. MSS.

- Macroceramus parallelus*, Arango, MSS. *Cylindrella Presasiana*, Pfr.
Macroceramus Blaini, Arango MSS. *Chondropoma Dunkeri*, Arango
MSS. *Helicina nuda*, Arango MSS.

Ueber die Anatomie der Gattungen Incillaria, Benson, und Meghinatium, Hasselt, in Vergleich mit der Philomycus, Rafinesque. BY WM. KEFERSTEIN, M. D., (Göttingen.)

Ueber Parmarion flavescens, sp. n., aus Mossambique. BY WM. T. KEFERSTEIN, M. D.

Beschreibung neuer Landschnecken. BY DR. L. PFEIFFER.

- Succinea Bogotensis*, New Granada. *Spiraxis linearis*, Mexico.
Helix Selenkai, Vera Cruz, Mexico. *Spiraxis Mexicana*, Mexico.
Helix ampla, Vera Cruz, Mexico. *Achatina histrio*, Hayti.
Helix effusa, Hayti. *Oleacina Berendti*, Mexico.
" *incisa*, Barbados. " *Smithiana*, Hayti.
" *impura*, Mexico. " *oblonga*, Mexico.
" *Wilhelmi*, " " *Paivana*, Hayti.
" *Smithiana*, Hayti. " *perpusilla*, Mexico.
" *obsita*, Mexico. *Cylindrella transparens*, Jamaica.
" *Hermannii*, Mexico. " *Smithiana*, Hayti.
" *Platonis*, Hayti. " *Berendti*, Mexico.
Bulinus Paivanus, Mexico. " *flexuosa*, Jamaica.
" *Chiapasensis*, Mexico. *Choanopoma Smithiana*, Hayti.
" *Ghiesbreghtii*, " " *Julieni*, Sombrero.
" *Kefersteini*, " " *Helicina Paivana*, Hayti.
" *Heynemanni*, " " *Moussoniana*, Turk's
" *Sporleideri*, " " Island.
" *heterogenus*, " " *Binncyana*, Hayti.
" " *Smithiana*, "
" " *Botteriana*, Mexico.

Ueber einige Africanische Binnenconchylien. BY ED. VON MARTENS.

1. Zusätze zur Uebersicht der Mollusken des Nil-Gebiets.

Monatsberichte der Königlichen Preuss. Akad. der Wissenschaften zu Berlin. 1865. 8vo.

Ueber neue Landschnecken aus Ost-indien, etc. BY DR. E. VON MARTENS.

- Cyclopus longipilus*, Celebes.
" *fulminulatus*, "
" *campanulatus*, Nangasaki, Japan.

<i>Alyceus Japonicus</i> ,	Yokohama.
<i>Cyclophorus bellulus</i> ,	Borneo.
" <i>ciliocinctus</i> ,	Java.
<i>Leptoma Moussoni</i> ,	Timor.
<i>Callia Amboinensis</i> ,	Amboina and Ceram.
<i>Helix myomphala</i> ,	Nangasaki.
" <i>quadrivolvris</i> ,	Borneo.
<i>Hyalina sinulabris</i> ,	Siam.
<i>Cassidula multiplicata</i> ,	Banca.
" <i>flaveola</i> ,	Ceram (Molluccas).
<i>Melampus Siamensis</i> ,	Siam.
" <i>nucleolus</i> ,	Amboina and Ceram.
" <i>sulculosus</i> ,	Amboina.
" <i>edentulus</i> ,	Flores Is.

Verhandlungen der Kaiserlich-Königlichen Zoologisch-botanischen Gesellschaft in Wien. XV. 8vo. 1865.

Conchiglie Dalmate inedite. BY SPIRIDIONE BRUSINA, of Zara.

<i>Raphitoma</i> , Bellardi, n. g.	<i>Danilia</i> , n. g., (<i>Trochidae</i>).
(<i>Pleurotomidae</i>).	<i>Ziziphinus candidus</i> .
<i>Raphitoma rosca</i> .	<i>Gibbula purpurata</i> .
" <i>polita</i> .	" <i>eluta</i> .
" <i>Sandrii</i> .	" <i>gibbosula</i> , Danilo and Sandri.
<i>Fusus Helleri</i> .	" <i>Ivanicsi</i> .
<i>Columbella marmorea</i> .	" <i>Linnei</i> .
" <i>decollata</i> .	<i>Stomatia Kutschigi</i> .
<i>Nassa semicostata</i> , Brocchi.	" <i>azonca</i> .
<i>Voluta pumilio</i> .	<i>Tapes Hüberti</i> .
<i>Mitra strata</i> .	<i>Tellina rostrata</i> .
" <i>columbulæ</i> .	<i>Mactra sericea</i> .
" <i>picta</i> , Danilo and Sandri.	<i>Scrobicularia fabula</i> .
<i>Cerithium Jadertinum</i> .	<i>Erycina tumida</i> .
" <i>subcylindricum</i> .	" <i>Bielzi</i> .
" <i>acicula</i> .	" <i>trigona</i> .
" <i>minimum</i> .	<i>Cardium Helleri</i> .
<i>Natica sanguinolenta</i> .	<i>Lucina tenuilamella</i> .
<i>Odostomia Nagli</i> .	<i>Kellia Boglici</i> .
" <i>Novegradensis</i> .	" <i>Spatangi</i> .
" <i>vitrea</i> .	" <i>Danili</i> .
<i>Turbonilla pygmæa</i> .	<i>Mytilus Baldi</i> .
<i>Phasianella crassa</i> .	
" <i>exigua</i> .	

This paper contains, besides the above, descriptions of numerous new varieties of species previously characterized.

Die Land-und Süswasser-Conchylien des Oetschergebietes.
BY WILHELM SCHLEICHER, in Gresten.

A simple catalogue of species and localities.

Zoologische Miscellen, IV. Amnicola lustrica, Say. BY GEORG RITTER von Frauenfeld.

Oesterreichs Gehäusetragende Bauchfüsser und Muschelthiere. Eine Systematische Aufzählung. BY JULIUS RITTER, v. SCHROCKINGER-NEUDENBERG.

A list of the land, fluviatile and marine shells of the Austrian Empire. About twelve hundred species are enumerated.

Zoologische Miscellen, V. BY GEORG RITTER, von Frauenfeld.

Abbildung der im Verzeichniss der Arten der Gattung Paludina, Lmk., aufgeführten neubeschriebenen nebst einigen noch neuerlichst aufgefundenen Arten.

This paper contains illustrations of Frauenfeld's new species of *Hydrobia*, *Bythinia*, *Amnicola*, *Lithoglyphus* and *Paludinella*, described in Vol. XIV. of this publication, as well as a few now first described.

<i>Bythinia Walderdorffi,</i>	Bugliavizza.
“ <i>Schwabii,</i>	Macedonia.
<i>Amnicola Schröckingeri,</i>	Massachusetts.*
“ <i>Montenegrina,</i>	Montenegro.
“ <i>Tachocensis,</i>	Tajo, near Ajuda.
<i>Lithoglyphus notatus,</i>	Dalmatia.
“ <i>Buschii,</i>	Buenos Ayres.
“ <i>turbinatus,</i>	Fiume.
“ <i>Pannonicus,</i>	Hungary, etc.

Beschreibung von seiben neuen Arten der Gattung Vivipara, Lmk.

<i>V. Selateri,</i>	Japan.
“ <i>Siamensis,</i>	Siam.
“ <i>heliciformis,</i>	Central Africa.
“ <i>punctata,</i>	West Africa.
“ <i>Jeffreysii,</i>	Lake Nyassa.
“ <i>capillata,</i>	“ “
“ <i>Robertsonii,</i>	“ “

* This, we believe, certainly = *A. limosa*, Say.

These are also published in the London Zoological Proceedings.

Ueber Limax Schwabii, v. Frd.

Zoologische Miscellen, VI. BY GEORG RITTER, VON FRAUENFELD.

Ueber zwei Meereschnecken von St. Paul.

Bursa (Apollon) proditor.

Novitates Conchologicæ. Part 23. Edited by DR. LOUIS PFEIFFER. 4to with three colored plates.

Contains illustrations of the following species, principally originally described in the *Malakozoologische Blätter*:

Helix Schwartziana, Pfr., *H. Wrightii*, Gundl., *Arctistria*, Pfr., *Licina percerassa*, Wrt., *Choanopoma echinus*, Wrt., *Cistula Jimenoi*, Arango, *Cyclostomus Römeri*, Pfr., *C. Heynemanni*, Pfr., all from Cuba,

Bulinus Juarezi, Pfr., from Mexico.

" *Anguillensis*, Pfr., *B. Lehmanni*, Pfr., from the Island of Anguilla, West Indies.

Helix Malinowskii, Zelebor, from Tuldscha.

Succinea Dunkeri, Zelebor, from Rumelia.

Helix Gysseriana, Pfr., *H. Lorquini*, Pfr., *H. Zoæ*, Pfr., *Cyclophorus eruentus*, Martins, from the Molluccas and Philipines.

Cyclophorus exaltatus, Pfr., var. ? *Clausilia Swinhoei*, Pfr., *Cl. Sheridani*, Pfr., from Formosa.

Novitates Conchologicæ. Part 2. Marine Mollusks. Edited by DR. W. DUNKER. No. 10. 4to, with three colored plates.

The following are the new species:—

<i>Anomalocardia subruba</i> ,	Philippines.
" <i>rugifera</i> ,	India.
" <i>paucigranosa</i> ,	Siam.
" <i>Carpenteri</i> ,	Australia.
<i>Arca bistrigata</i> ,	India.
" <i>Adamsiana</i> ,	China.
<i>Barbatia pectunculiformis</i> ,	Borneo.
" <i>Rodatzii</i> ,	Zanzibar.
" <i>eximia</i> ,	Habitat ?

Novitates Conchologicæ. Supplement III. Monographie der Mollusken gattung *Venus*. By DR. EDWARD RÖMER. No. 4, with three colored plates.

This part contains the conclusion of the genus *Meretrix*, and the following new species:—

M. compressa, Chinese Sea.

ITALIAN.

Enumerazione dei Molluschi del Golfo di Trieste. By ADOLPH STOSSICH, 4to, 19 pp. Trieste, 1866.

Fusus Titii.

Rissoa salinæ.

About four hundred species are enumerated, of which the above are new; there are frequent remarks on locality, specific differences, etc.

Dei Molluschi raccolti dalla Missione Italiana in Persia. By A. ISSEL. 4to. 53 pp., 3 plates. Turin, 1865.

The following are the new species described:—

<i>Nassa Deshayesiana.</i>	<i>Bulinus tridens</i> , var. <i>attenuatus</i> .
<i>Columbella Dorie.</i>	“ <i>Isselianus</i> , Bourguignat
<i>Melanopsis mingrelica</i> , var.	“ <i>Ghilanensis</i> .
“ <i>carinata</i> .	“ <i>Armeniaca</i> .
“ <i>Dorie.</i>	<i>Clausilia Erivanensis</i> .
<i>Bythinia Uzielliana.</i>	“ <i>Lessonæ</i> .
“ <i>Meneghiniana.</i>	<i>Ancylus Jani</i> , var. <i>major</i> .
<i>Theodoxus (Neritina) Dorie.</i>	<i>Limnæa Defilippii</i> .
“ <i>Schirazensis</i> , Parreys,	“ <i>Lessonæ</i> .
<i>Helix Stauropolitana</i> , var. <i>elegans</i> ,	“ <i>auricularia</i> , var.
<i>Bulinus interfuscus</i> , Mousson.	“ <i>persica</i> , Bourg.
“ <i>Dorie.</i>	<i>Monodacna Lessonæ</i> .
“ <i>Anatolicus.</i>	<i>Dreissena Eichwaldi</i> .

The above are all from Armenia, Persia, the Persian Gulf and Caspian Sea.

SCIENTIFIC INTELLIGENCE.

THE genus *Pupoidea*, of Mr. Pease, published in this Journal for January, 1866, appears to be the same as *Palaina*, of Mr. O. Semper, of which several species have been figured in recent numbers of the "Journal de Conchyliologie."

Mr. Pease proposes to change his name *Helix sculptilis*, pre-occupied by Mr. Thomas Bland, to *Helix fratercula*.

MR. FRANK DAULTE, of Cincinnati, Ohio, a zealous collector, informs us that he has obtained a sinistral specimen of *Helix elevata*. Reversed *Helices* are not nearly so numerous in America as in Europe, and this is the first published notice of a reversed *elevata*. Mr. Bland, in his "Remarks on Certain Species of North America Helices," mentions that his cabinet contains sinistral specimens of *H. alternata*, *thyroides* and *Mitchelliana*; that Mr. Binney has *H. fallax*, Mr. Isaac Lea *H. hirsuta*, and Mr. Anthony *H. inflecta* and *solitaria* reversed.

MR. J. G. ANTHONY writes to us that *Paludina scalaris*, Jay, commented upon by us in this Journal, (p. 116, 1866,) is a good species, as he has seen at least fifty specimens of it, none of which vary from Dr. Jay's figure. He was informed by a person who collected it, that in certain localities it occurs abundantly.

NOTE ON *HELIX FIDELIS*, Gray. By John H. Thomson, New Bedford, Mass. I received last summer three specimens of this

snail, living, from a correspondent in California. During the rainy season on the West Coast my shells were exceedingly active, and decidedly nocturnal in their habits. They laid eggs respectively on January 19th, Feb. 9th and 19th, this year, burying themselves in the earth all except the upper part of the shell during this operation, and remaining so for about 48 hours; each laying from 100 to 150 eggs in a mass. The eggs are about one millimetre in diameter; I kept each lot separate, and found them to hatch in from 22 to 23 days. The young animal is more of a bluish cast than the old ones, and the shells when a day old have already attained the size of $4\frac{1}{2}$ millimetres and are yellow banded.

I am sorry to record the loss of many of my young specimens from a dreadful piece of cannibalism. I kept in the same box with them a *Helix hortensis*, which, on the approach of cold weather last autumn, became torpid and buried itself in the earth: yesterday at noon it revived, and by this morning had eaten up at least 75 or 80 of the young *Helix fidelis*!—*New Bedford, Mass., April 8th, 1866.*

We may notice that a splendid specimen of *Helix Mormonum*, recently sent to us alive, by our friend Dr. Wesley Newcomb, of Oakland, California, is also almost entirely nocturnal in its habits. This individual frequently exhibits its buccal plate very prominently; the jaw is of large size and deep yellow in color.

POLYMORPHISM AMONG BRYOZOA.—Dr. A. F. Smith, in his inaugural dissertation, published at Upsala in 1863, has shown conclusively the existence of Polymorphism among Bryozoa. His investigations are based upon the marine species of the Scandinavian Coast. He shows that there are no less than six different forms of shells, which are probably never all found on the same stock. According to his view the Avicularia are only modified cells. Stoliczka was the first to call attention to the Polymorphism of Bryozoa in his studies of fossil Bryozoa. The paper by Smith is unfortunately not illustrated, and is written in a language available to but few naturalists.—*Alex. Agassiz, in Am. Jour. of Science and Arts, July, 1866.*

The name of *Helix Bridgesii*, which I gave to a species collected by the late Mr. Bridges in Nicaragua, being preoccupied

by Dr. Newcomb for a California species, I propose to designate my species by the name of *H. Parkeri*, dedicated to Mr. C. F. Parker, of Philadelphia. The description is in *Am. Jour. Conch.*, ii., p. 303, Oct., 1866. G. W. T., Jr.

ON VALVATA JELSKII, *Crosse*.—By Prof. O. A. L. Mörch, (In a letter to the Editor.) “The species described and figured by M. Crosse under this name (*Jour. de Conchyliologie*, 1863, p. 382, pl. 13, f. 3,) is the young of *Lithoglyphus*. I found it on some specimens of *Lithoglyphus* from Mr. Crosse. The old shells were covered with a vesicular clayish coat, and each vesicle contained a single so-called *V. Jelskii*.—*Copenhagen, Aug. 6th, 1866.*

OBITUARY.

AUGUSTUS ADDISON GOULD, M. D.

This illustrious conchologist died suddenly of cholera, in Boston, on the 15th of last September, aged 61 years. He was a man of highly cultivated mind and liberal views, and attained a distinguished rank in other branches of science besides that which was his favorite study, and by which he is best known to our readers.

As one of our earliest conchological authors, Dr. Gould aided much in the description of our native shells; afterwards his extensive knowledge of the science caused him to be selected by the United States Government to describe the collections made by its exploring expeditions. He was an indefatigable worker, and his descriptions are models of accuracy and perspicuity. In his general acquaintance with the science in all its branches he was perhaps unequalled by any other American student, and the immense stores of his knowledge as well as his time were always so freely at the service of every one who pursued the study of the mollusca, that his influence upon the progress of the science among us can scarcely be overestimated, and certainly far exceeds that exerted by the works he wrote,—valuable and numerous as they are. The latter comprise :

Lamarck's Genera of Shells; with a Catalogue of Species.
12mo., Boston. 1833.

Report on the Invertebrata of Massachusetts. Svo., pp. 373.
Cambridge, 1841. (Published by the State.)

Report on the Mollusca collected by the Wilkes' United States Exploring Expedition. One folio volume of text, Boston, 1852, and an elephant folio volume containing 51 colored plates, 1860.

Catalogue and descriptions of the shells of Lake Superior, in "Lake Superior," by Prof. Agassiz. 8vo., Boston, 1850.

Descriptions of the shells collected by the North Pacific Exploring Expedition. (Proc. Boston Soc. Nat. History.)

Besides over *fifty* memoirs on various branches of Conchological Science, including criticisms on various papers by other authors, remarks on distribution, habits of the mollusca, etc. These were principally published in the Proceedings and Journal of the Boston Society of Natural History, a society of which Dr. Gould was one of the most prominent members.

When the death of Dr. Binney left unfinished his splendid work on the "Terrestrial Mollusca of the United States," Dr. Gould was chosen by his executors to continue and complete the work; which he performed in most excellent style, adding many additional descriptions and a memoir of its distinguished projector.

For the last two years Dr. G. was engaged on a new edition of his "Invertebrata of Massachusetts," the first edition being long out of print. To enable him to publish this valuable work the Legislature of Massachusetts made an appropriation of \$4,000 in 1865. We trust that his labors were so nearly completed at the time of his death, that this book may be published.

The collections of Dr. Gould, which were very valuable, containing types of the species, nearly *one thousand* in number described by him, have become the property of the Boston Society of Natural History. They form a nobler monument to his memory than was ever reared of sculptured marble, and tell the story of his life in more eloquent terms than the pen can express.

G. W. T., Jr.

MAJOR ROBERT KENNICUTT.

This gentleman died on the thirteenth of last May, at Fort Nulato, in Russian America. As an ardent and successful explorer, and collector of objects of Natural History, he was well known to most of the Scientists of the United States. He was particularly interested in the study of the Mollusca of the boreal regions which were the scenes of his principal explorations, and spoke to the writer in enthusiastic anticipation of the pleasure

which he would experience in collecting the shells of the high latitudes of the Pacific coast, only a few days before starting on the expedition which has proved his last effort in the cause of science. Major Kennicutt was one of the founders and principal promoters of the Chicago Academy of Sciences—an institution for the prosperity of which he worked almost unremittingly. His published papers are few in number; he was in habit too active, in disposition too ardent to become a closet-naturalist; his proper sphere of action was in the field, amidst the wilds of unexplored nature, and amidst danger and privation. At the time of his death Major K. was acting as commander of the Russian-American Telegraph Exploring Expedition. G. W. T., Jr.

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A M E R I C A N JOURNAL OF CONCHOLOGY. NEW SERIES.

PUBLISHED BY THE

CONCHOLOGICAL SECTION of the Academy of Natural Sciences of Philadelphia.

VOL. III.

1867.

No. 2.

Meeting, February 7th, 1867.

Eight members present.

MR. TRYON, Vice-Director, in the Chair.

Donations to the Library and Museum were announced.

A letter was read from G. W. Tryon, Jr., donating a number of works on Conchology, to be sold by the Section, and the proceeds invested in its Conservator's and Publication Funds.

The following paper was offered for publication, and referred to a committee:

Descriptions of new species of Fresh-water Shells of Michigan. By A. O. Currier.

Verbal communications:

Dr. S. B. Howell spoke on the development of a hectocotylus arm, its universality in all male Cephalopods, its anatomy and use.

The Chairman addressed the Section upon the faculty alleged to be possessed by the animal of *Cypræa*, of dissolving its shell and forming a new one to meet the necessities of its growth; illustrating his remarks by specimens from the Museum. He also showed that the spots upon the exterior surface of the shells of some species of Cowries, which indicate the bases of the filamentous growths upon the mantle, do not exist upon young shells, and therefore it is probable that these growths do not commence until the animal approaches maturity.

Meeting, March 7th, 1867.

Four members present.

MR. TRYON, Vice-Director, in the Chair.

Donations to the Museum and Library were read.

Dr. C. J. Cleborne was elected a member, and the following gentlemen were elected correspondents:

John G. Anthony, Cambridge, Mass.

Louis Agassiz, Cambridge, Mass.

P. J. Van Beneden, Bruxelles, Belgium.

Thomas Bland, New York.

P. P. Carpenter, Montreal, Canada East.

Hon. L. E. Chittenden, New York.

G. P. Deshayes, Paris, France.

Dr. Wm. Dunker, Marbourg, Hesse.

Wm. H. De Camp, M. D., Grand Rapids, Mich.

Geo. Ritter von Frauenfeld, Vienna, Austria.

Wm. M. Gabb, San Francisco, California.

Prof. Theo. Gill, Washington, D. C.

John Edward Gray, British Museum.

Prof. Jas. Hall, Albany, N. Y.

Prof. F. S. Holmes, Charleston, S. C.

John C. Jay, M.D., Mamaroneck, Westchester Co., N. Y.

J. P. Kirtland, M.D., Cleveland, Ohio.

Frederick Krauss, Stuttgart, Wirtemberg.

James Lewis, M.D., Mohawk, N. Y.

Albert Mousson, Zurich, Switzerland.

Edward S. Morse, Portland, Maine.

F. B. Meek, M.D., Washington, D. C.

Temple Prime, New York.

Aug. Rémond, San Francisco, Cal.

E. R. Showalter, M.D., Uniontown, Ala.

Prof. D. S. Sheldon, Davenport, Iowa.

G. B. Sowerby, London, England.
John H. Thomson, New Bedford, Mass.
Dr. Wm. Stimpson, Chicago, Ill.
Patricio Maria Paz, Madrid, Spain.

Meeting, April 4th, 1867.

Ten members present.

MR. TRYON, Vice-Director, in the Chair.

Donations to the Museum and Library were announced.

Several letters requesting exchanges of specimens and publications were read, and appropriately referred.

The American Journal of Conchology, Vol. III. No. 1, was presented by the Publication Committee.

The following papers were presented for publication, and referred to committees :

On the systematic arrangement of *Buccinum altile* and *B. Escheri*. By Prof. Theodore Gill.

On the genus *Fulgur* and its allies. By Prof. Theodore Gill.

Monograph of the Terrestrial Mollusca of the United States. By Geo. W. Tryon, Jr.

On the various principles of Zoological Classification. By Prof. O. A. L. Mörch, of Copenhagen.

The following resolutions were adopted :

Resolved, That a committee of five be appointed to prepare for publication, under the authority of this Section, a complete catalogue of the described genera and species of recent Mollusca, and their synonyms; designating their localities and bibliography.

Resolved, That the above work be published in parts containing families or genera, as fast as completed, and so arranged as to be capable of being used in labelling collections.

Dr. Samuel Lewis, of Philadelphia, was elected a member.

DESCRIPTION OF NEW SPECIES OF FRESH-WATER
SHELLS FROM MICHIGAN.

BY A. O. CURRIER.

PHYSA DEFORMIS, Currier.—Plate 6, fig. 1.

Description.—Shell small, narrowly ovate, thick; whorls 4, well rounded, the last not proportionately enlarged, but somewhat flattened, which, in connection with its well-rounded whorls, gives the shell a deformed appearance. A broad, thick deposit of callus on the body whorl extends to the base of the columellar lip, which is twisted and appressed.

Length 10, diam. 4 mill.

Habitat.—Grand Rapids, Michigan. My Cabinet. Cabinet of Academy of Natural Sciences.

BULINUS TRYONI, Currier.—Plate 6, fig. 2.

Description.—Shell cylindrical, smooth, dark horn color; whorls 6, flatly rounded; aperture one-half the length of shell, pink within; columella twisted, with a light callus.

Length 18, diam. 6 mill.

Habitat.—Grand Rapids, Mich. My Cabinet. Cabinet of Academy of Natural Sciences.

Observations.—This shell differs from *B. hypnorun* by its larger size, less attenuated spire, more twisted columella, and its uniform pink aperture.

MELANTHO GIBBA, Currier.—Plate 6, fig. 3.

Description.—Shell rhombic, imperforate, rather thick, somewhat roughened by lines of growth; epidermis greenish brown; whorls 5, well rounded, the last subangulate; aperture rhombic, half the length of shell, tinged with rufous within; columella white, thickened by a callus which extends across the parietal wall of the aperture.

Habitat.—Grattan, Mich., (C. M. Slayton, Esq.) My Cabinet. Cabinet of Academy of Natural Sciences.

Observations.—Differs from *M. rufa*, Hald., by its smaller size, more rounded whorls, and its uniformly rhombic outline.

ANODONTA SUBCARINATA, Currier.—Plate 6, fig. 5.

Description.—Shell smooth, elliptic, rounded before, biangulate behind, and very inequilateral; epidermis bright yellow, with numerous faint green rays over the entire surface; lines of periodic growth well defined by a brighter yellow, from which spring numerous arboreiform, raised markings on the anterior basal portion; two well-defined flat carinæ radiate from the umbones to the angle of posterior margin; substance of shell thin; nacre silvery white and very iridescent.

Habitat.—Pentwater, Oceana County, Mich, (J. A. McNiel, Esq.) Cabinet of J. A. McNiel. Cabinet of the Academy of Natural Sciences, Philadelphia.

Observations.—I am indebted to my friend J. A. McNiel for the opportunity of describing this beautiful species. He has for several years devoted much time to collecting the shells of this genus, with marked success, having, by his liberality, furnished the many forms from this State, described in this Journal, with others yet to be characterized.

This shell resembles nearly *An. pallida*, *glandulosa* and *irisans* of Anthony, but differs from either in color, in being more decidedly biangulate, in the prominent carina, the arboreiform markings, different position of lines of periodic growth, and in general appearance. It is altogether our most beautiful species.

"*Filum ariadneum Botanices est Systema, sine quo Chaos est res herbariæ.*"—LINN.
 PHIL. BOT., §. 156.

ON THE VARIOUS PRINCIPLES OF ZOOLOGICAL CLASSIFICATION.

BY DR. OTTO A. L. MÖRCH, OF COPENHAGEN, DENMARK.

In my last papers on classification of Mollusca, in the *Annals and Magazine of Natural History* and in *Journal de Conchyliologie*,* the term *Class* is used for divisions, which, according to the general opinion, may seem too high a rank. As the term class is used in the most different senses in various parts of the animal kingdom, it may be necessary to give a more extensive explanation of my views in this respect.

The old authors, as Belon, Rondelet, Gesner, Aldrovand, Lister, Rumph, signified the various systematical divisions by *Liber*, *Cap.*, §, *titulus*, corresponding to *Classis*, *Ordo*, *Genus*, *Species* of Linné† and nearly all succeeding naturalists.

Lamarck, Cuvier and Blainville introduced the *Familie*‡ corresponding to the *Fragmenta* of Linné (*Phil. Bot.* § 77),—a division which he did not use himself in the *Systema*, considering it only necessary for the future natural system.

The most important addition to the Linnean terms for systematic divisions, is no doubt the *Supraclasis* of Rafinesque,§ who first perceived the necessity of giving particular systematic

* *Journal de Conchyliologie*. 1865.

† *Tournefortio debet Botanice hos familiarum limiter.*—LINN. PHIL. BOT., § 155.

‡ First used by d'Argenville, *La Conchyliologie*, 1742.

§ Rafinesque, *Specchio della Scienze o Giornale enciclopedico de Sicilia*, 1817, p. 216. *Principes fondamentaux de Somiologie ou loix de la nomenclature et de la classification de l'empire organique*. Palerme, 1814.

titles and names to the warm and cold-blooded vertebrata, viz., Thermalia, Sicremia. Latreille adopted (1825) this view, changing the names to Thematherma and Hæmacryma, under the misleading title of rank or races.

The following terms seem indispensable to indicate the value of the higher systematic divisions :

1. *Regnum*, L., (= Imperium, Raf. Embranchement of French authors.)
Expl. R. animale, R. vegetabile, R. cryptobiaticum, Buquoi.
 2. *Semiregnum*, Anth., in Revue et Mag. de Zoologie.
Expl. Vertebrata and Evertebrata, (= Vertebrata and Articulata* on one side, opposite to the Inarticulata or Mollusca and Radiata on the other.†)
 3. *Subregnum*, Owen. (Regnum, Raf. ; Typus, Blv. ; Penplades' Latr. ; Provincia, Fitz.)
Expl. Vertebrata, Articulata, Mollusca.
 4. *Supraclassis*,‡ Raf. (Races, Latr. ; Series, Mörch, 1865.)
Expl. Thermalia, Sicremia, Insecta, Monotocardia, Diotocardia.
 5. *Classis*, L. et Auct.
Expl. Mammalia, Aves, Herpetia, Pisces, Mandibulata, Haustellata, Aptera, Androgyna, Exophallia, Pseudophallia, Acephala.
 6. *Semiclassis*.
Expl. Placentalia, Aplacentalia, Reptilia, Amphibia, Arachnida, Crustacea, Coleoptera, Pulmonata, Opisthobranchia.
 7. *Subclassis* is perhaps not different from the preceding division.
Expl. Macrosthenia, Microsthenia of Dana ; Geophila, Hydrophila.
 8. *Præordo*.
Expl. Unguiculata, Ungulata Owen.
 9. *Ordo*.
Expl. Quadrumana, Carnivora, Herbivora, Mutilata.
 10. *Subordo*. 11. *Familia*. 12. *Subfamilia* (Phalanx v. d. Hooeven).
- Genus, Subgenus, Species, Subspecies* or doubtful species.

* Acrozoces,

† Hydrozoces, Lamoraux, Soc. Linn. de Calvados, 1825.

‡ Perhaps more correctly *Præclassis*.

Review of the principal Zoological Systems.

The most striking peculiarity of animals, upon a superficial consideration, is the different organization depending on the various kinds of locomotion,—viz.: walking, creeping, flying and swimming, being in accordance with the elements of habitation. In the Genesis and Leviticus the animal kingdom is arranged in this popular manner:

I. The great land animals or beasts.

- a. The small or creeping land animals (Micromammalia, lizards).

II. The fowls, as the eagle, the ossifrage, &c.

- a. The fowls that creep, going upon all fours (Coleoptera), or
- b. Flying creeping things that goeth upon all fours, which have legs with which to leap upon the earth, as the locust and the bald locust, the beetle and grasshopper.

III. Fishes, which are divided into the whales or great monsters of the sea (sharks).

- a. Fishes with scales and fins.
- b. Fishes without scales and fins (Mollusca, Worms).

This arrangement, probably Egyptian, has the same claim to the name of a system as that of Aristotle, chiefly as it was adopted by Charleton. Klein even quoted it as an authority in opposition to the Linnæan system, as the Roman clergy and others used the naive history of the creation against the doctrines of modern astronomy and geology.

Aristotle divided the animal kingdom according to the internal structure, independently of their locomotive organs, into *ἐγγύματᾱ* and *ἀγγύματᾱ* which were adopted by Cuvier under the less erroneous names red- and white-blooded animals, changed again by Lamarek to the names generally now used—Vertebrata and Evertebrata. Aristotle divided the Vertebrata on the same erroneous principles as Moses, using the number of legs as the principal base for the secondary divisions.

Ray (1693) divided the Vertebrata according to the structure of the heart and respiratory organs. In this manner the Cetacea were united to the Quadrupeds or Mammalia, and the reptiles removed below the birds. This arrangement was not adopted by Linné before the year 1758,* in his fourth edition of the *Systema Natura*, generally called the tenth.

Cuvier (1799) arranged the orders of the Mammalia chiefly

* Brisson used it perhaps in 1756.

according to the locomotive organs, placing the whales lowest, next to the Pinnipedia; the rest being arranged according to the development of the prehensile power of the locomotive organs.

Owens' system of the Mammalia, according to the generative organs in Placentalia and Aplacentalia, reduced suddenly the value of the locomotive organs as characters for higher divisions; placing the Whales over the Marsupialia, many of which have prehensile limbs. But a still greater revolution, corresponding to that called forth by Ray, was the same author's division according to the anatomy of the brain (*Gyrencephala*, *Lissen-cephala*), by which the Bruta, Cheiroptera, Insectivora and Rodentia were removed below the Cetacea, close to the Marsupialia.

The locomotive organs, chiefly the legs, are still generally considered as a natural base for the arrangement of the birds, being in accordance with their buccal parts. The little importance of the locomotive organs in the reptiles and fishes as characters for superior divisions, has long since been proved. The Lophobranchii are generally considered more allied to the fishes than to the Amphibians, although they have scarcely more properties in common with the former than the fins, as in the whales.

According to Prof. Owen, the Lophobranchii, like the higher animals, have a distinct thorax and abdomen; the skull approximates more nearly to the type of cranial organization in the lower forms of reptiles. Digestive and reproductive organs are like those of the Amphibians. The respiratory organs are quite different from those of the Teliosts, or true fishes, but agree with those of the Amphibians chiefly in the young state. It seems therefore probable that the Amphibians may be restored in the original Linnean sense, as accidentally founded on an erroneous observation of Dr. Garden.

A close comparison by competent naturalists of the following three series would at once prove the true relations between the oceanic and terrestrial orders:

1. Pachydermata.	1. Batrachia.	1. Patella.
2. Sirenia.	2. Ichthyodea.	2. Dentalia.
3. Cetacea.	3. Lophobranchia.	3. Cephalopoda.

Among Arthropoda the number of the locomotive organs is still considered the principal base for the classes; it is only lately that the apterous hexapod insects are put in their due place according to their oral parts, and the Myriopoda degraded to an order of Crustacea. The Molluscan system is generally

based on the locomotive organs, the Gasteropoda corresponding nearly to Anthropoda among Articulata, and Pedata of Klein among Vertebrata.

On the Natural System.

Linné first showed clearly the difference between the synoptical method and the natural system.

“Synoptica divisio seculo, xvi. and xviii. maxims in usu fuit.”

“Systematica vero seculo, xviii. præcipue exculto fuit, incepta a Tournefortio and Rivino.” Phil. Bot. § 153.

“Methodus naturalis est ultimus finis Botanices.” Ib. § 163.

In attributing the titles of rank of the systematic divisions, and indicating their relative superiority or inferiority, Linné, like most modern authors, was simply guided by instinct, but in a manner which showed his lofty systematic genius, which always guided him in finding the method closest allied to the natural system. “Naturalis *instinctus* docet nosce primum proxima et ultimo minutissimo, ej. Homines, Quadrupedia, Aves, Pisces, Insecta, Acaros, vel primum majores plantas, ultimo minimos Muscos.” Phil. Bot. § 153.

“Methodici summi methodo mathematica, in scientia naturali, a simplicioribus ad composita adscendunt, *adeoque* in cepere ab Algis, Muscis, Fungis, uti Rajus, Boerhaaisus, &c.

“Natura non facit saltus.” Phil. Bot. § 153.

“Facies externa vulgo a Botanicis antea dictus est habitus. Listerus et Linneus egregie ex habitu conchyliorum divinarunt earundem affinitates, ut ipsi Systematica sæpius deflexerint, ubi habitus recta duxerat.” Ib. § 163.

“Fructificatio (dentes linguales*) recentiorum inventum, viam primario apemit ad methodum naturalem, sed nec hoc etiamnum ita intelligitur, ut omnes classes delegat. Habitu, uti in Quadrupedibus distinguit Feris a Pecoribus quamvis dentes non respiicerentur; sic etiã in plantis sæpe harum ordines naturales primo intuitu manifestat.” Phil. Bot. § 163.

These are the principal systematic principles of Linné. Linné knew well that the organic creation was not to be arranged in a single line from man to the monad, as Bonnet believed,—viz. :

“Natura ipsa sociat et conjungit Lapidés et Plantas, Plantas et Animalia; hoc faciendo non connectit perfectissimas Plantas cum Animalibus maxime imperfectis dictis, sed imperfecta Animalia et imperfectas Plantas combinat, e. gr. Lernæum, Animalculum et Confervam Algam. Spongiam Algam et Corallia Animalia; Tæniam, Conferva marticulatam, Corallinam.” Ib. § 153.

* The botanical names are changed to conchological.

This principle is one of the most important in comparative Taxonomy, although overlooked by most naturalists; but it must be extended to every higher division. Thus, the ducks do not follow the *Ornithorynchus*, but the birds, which are most different from *Mammalia*. Among *Articulata* the lobsters, notwithstanding their gills, do not follow the fishes.

On the Physiophilosophical Systems.

The chaotic assemblage of new species brought together from all parts of the world by the successors of Linné caused several philosophical naturalists to believe that the organic world was subject to certain laws, like the inorganic world. This merely indistinct thought is thus expressed by Swainson (l. c. p. 319): "No one who believes in the existence of an omnipotent Creator, can suppose for a moment that the innumerable beings which he has created were formed without a plan."

Oken* showed (1802) first that the animals must be arranged according to principles, and not according to characters. Oken considered thus the animal kingdom as a dissected human body. The classes are the special representations in living forms of the highest beings in creation, as *Mammalia* (sense animals), birds (nerve animals), reptiles (muscle animals), fishes (bone animals). This system, founded more on an ingenious idea than on *independent inquiry*, may perhaps be partly right, although the state of zoology at that time made it impossible to prove its correctness.

The circular theory of Friis and Mac Leay was no doubt borrowed from astronomy, and is a lamentable example of what prejudiced opinions can bring men of great learning "to discover." The following is an example of a circle of affinity: (Penguins) Birds, Quadrupeds, (Whales) Fishes, Frogs, Reptiles, (Tortoises) Penguins.† Analogies‡ of the most different degrees are here confounded with affinities, although it is one of Mac Leay's and Swainson's greatest merits to have shown the importance, in systematic zoology, clearly to distinguish between analogy and affinity. The labors of Friis and Mac Leay are only intelligible to mycologists and entomologists, being founded on comparatively small groups; therefore, Swainson's works may be consulted by those who require knowledge of Mac Leay's doctrines.

* Agassiz' essay on Classification in the Natural History of the United States, contains the most extensive history of classification.

† Or Struthions—Birds, Kangaroos, Armadilloes, Tortoises, Boas, Tigers, Seals, Whales, Fishes.

‡ Recurrent forms, of Collingwood "On Recurrent Animal Forms," *Annals and Mag. of N. H.* August, 1860, p. 83.

W. Swainson has the merit of introducing a truly scientific method of determining the values and relative ranks of the various zoological divisions, although the manner in which he followed his own rules proved erroneous in most instances, not being based sufficiently on anatomical inquiries, at that time in their first infancy. The following rules of Swainson appear to me to be the most important.

"The true rank of a natural group can only be detected by analysis and analogy; and the more extensively these enquiries are carried into the neighboring groups the more likely are we to understand its true rank."*

"The verifications of a natural group are three, (Sw. *ib.* p. 287.)

I. The circular series of its contents.

II. The parallel relation of its parts to other groups.

III. The symbolical representation of the primary types of nature.

The first rule may be considered imaginary and entirely in opposition to the second.

The arrangement according to analogy in parallel series was first used by Oken and Agard, and may be considered the only true manner of natural arrangement. MacLeay considered the series as assuming a circle, but Swainson has explained it more fully.

How well Linné† understood the application of this arrangement to show the difference between affinity and analogy, is proved by his arrangement of the faculties of the human mind and the systematic terms of rank, but he did not consider it proper for the arbitrary system he was compelled to use for want of the natural system.

The third verification, the theory of representation, is considered by Swainson the only certain test of a natural group. "Every perfect group has its own typical and aberrant forms; and these are represented by the typical and aberrant forms in another perfect group. In tracing the analogy between two series of animals, we can never compare a typical group in one circle with an aberrant group in another." The latter sentence is exceedingly important and indispensable to any comparison, but frequently neglected.

* Swainson on classification, p. 169.

† *Syst. naturæ* ed. xii. p. 11, 13, 17. *Amœnitates academicæ*, vii. p. 326. *Philos. botanica*, § 155.

I. "The typical group contains the most perfectly organized animals." (Sws. l. c. p. 242. § 301 and 302.)

II. "Subtypical groups exhibit an intermediate character between typical and aberrant groups. They do not comprise the largest individuals in bulk, but always those which are the most powerfully armed, either for inflicting injury on their own class, for exciting terror, producing injury, &c.; they are symbolically the types of evil and comparatively not very fertile."

III. The aberrant groups depart much more from those which belong to pre-eminent types than these latter do from the subtypical. The aberrant groups are naturally divided into three distinct types—aquatic, suctorial and rasorial—names used in ornithology, the only division of zoology wherein they have been accurately traced. These collectively form the aberrant circle of every group in the animal kingdom.

Expl.—

Typical.

1. Mammalia. 1. Ungulata. 1. Rodentia. 1. Digitigrada.

Subtypical.

2. Marsupialia. 2. Ungulata. 2. Insectivora. 2. Plantigrada.

Aberrant.

3. Birds. 3. Mutilata. 3. Cheiroptera. 3. Pinnigrada.

Typical: 1. Ox, Horse, Lion.

Subtypical: 2. Bison, Zebra, Tiger.

Aberrant: 3. Cat.

1. "The natatorial, aquatic or apod type; enormous bulk, the disproportionate size of the head and the absence or very slight development of the feet. Seize the food with the mouth alone."

Expl.—Aquatic Birds, Whales, Fishes, Acalepha, Cephalopoda, Elaniosauri."

These characters are entirely dependent upon the physical properties of the water; a ship, for instance, can thus be constructed much larger than a carriage or a balloon.

2. "The suctorial type; these are always the smallest in point of size, the mouth feeble and defenseless in structure, and the most defective in the organs of mastication. In such as belong to the vertebrated circle, the feet are always fully developed, for these animals are peculiarly active, and enjoy, in a remarkable degree, the power of running and leaping. The head is always very small, generally prolonged into a pointed snout, and the mouth, as adapted for sucking, is uncommonly small; in some few

instances it is not, in fact, apparent. All animals belonging to this type are shy, and evince little or no offensive disposition; but nature, as if to screen them from their enemies, has endowed them with great caution, uncommon vitality, and in many cases has protected them either with hard skin or a coating of bony armor. (Sws. p. 255.)

Expl.—Tennirostral type among birds, Gliriforms among Quadrapeds, Birds, Haustellata, Dasypus.

3. The rasorial type. These are, in general, remarkable for their size, being inferior only to the natatorial type. From these they are further to be distinguished by the strength and perfection of their feet, the toes of which are never united so as to be used for swimming. This perfection, however, is of a very peculiar kind, since it is confined to the powers of walking on dry land, or of climbing among trees. This is the type so remarkable for the greatest development of tail; and of those appendages, for ornament or defence, which decorate the head.

Expl.—Ruminantia, Gallinacea, Lamellicornia.

Swainson's works contain numerous systematic observations of the highest value, but the general results are nearly always erroneous, chiefly because he overlooked the fact that Rasorial, Suctorial and Aquatic, in reality, are the same things as Typical, Subtypical and Aberrant. Of still greater consequence was it that Swainson did not observe that the Vertebrata form two distinct series or, as he would call it, circles, and that the Marsupialia have the same claims to be considered a class as the Amphibianis. The Quinary arrangement, discovered in 1817 by MacLeay in considering "a small portion" of Coleopterous Insects, was chiefly supported by this erroneous division of the Vertebrata in five classes. Quinaryism may be considered entirely arbitrary, although Früs, Oken* and DeCandolle independently found the same number to be the clue to all natural groups. Kaup† has advanced that not more than five species could be found in a subgenus "only," founding this law on the study of the Falconidæ, but seems afterwards to have abandoned this theory in studying the graminivorous birds, probably discovering that "nature seems to make up by number what she withholds in size," (Sws. l. c. p. 245.)

Cuvier was the greatest adversary of the physiophilosophical classification, considering these researches as only idle speculations. It was chiefly against the doctrine of the homologies of the Vertebrate skeleton as put forth by Skelling, Oken and

* Chiefly founded on the five senses.

† Archiv für Naturg. 1851, 17, p. 92. Isis 1847, p. 39.

Geoffroy St. Hillaire, that his sneering satire was directed. This doctrine has now, chiefly through the labors of Prof. Owen, become universally adopted as one of the main principles of natural science. Perhaps the comparison of analogical species of different groups will some day take the same rank in the science.

On the embryological systems.

Redi and Schwammerdam founded, in 1669, a system for the lower animals according to their development, (chiefly of the Insects.) It was only in this century that the development of the marine animals became sufficiently known that it could serve as a base for a system.

M. Edwards,* Owen and Van Beneden, considered the development of an animal to indicate its place in the system, and that the various forms represented the different stages of foetal development. Later discoveries have, however, shown that animals nearly of the same genus have different modes of development, for instance *Astacus*, *Homarus*, *Asteridæ*. The development proves only relative superiority and inferiority between animals of the same group and living under the same circumstances, but not the limits of higher systematic divisions. *Marsupialia* and *Amphibia* are very natural groups, although many of the former want the pouch, and the development of the young of the latter group is rather variable. Prof. Dana† has lately based a new classification on the different arrangement of the locomotive organs and introduced a corresponding nomenclature which may prove of great use if applied to *Præordines* or to *Subclasses*, but not to higher divisions. Thus, *Neuroptera* are removed from *Orthoptera* to *Pteroprosthena* (*Lepidoptera*, *Hymenoptera*) whilst *Hemiptera* are associated with *Orthoptera* and *Coleoptera* in the group *Pterometasthenica*, notwithstanding their oral parts!

On the guiding laws of zoological classification.

The principal aim of taxonomy is to decide the rank and relative relations of the various systematic divisions. These relations are generally determined entirely arbitrarily, without reference to zoology in general; chiefly because most naturalists content themselves with studying single groups without comparison of the alterations and reciprocal relations of the organs throughout extensive suites. Great vitality or special development of a single organ are frequently erroneously considered characters of superiority chiefly among the lower animals, although a com

* *An. Sc. Nat.*, 3 Ser. t. 2, 1844, p. 162. Owen Lectures, 1843.

† *The American Journal of Science and Arts*, ix. p. 369.

parison with the higher animals would prove the contrary. The following principles are those which I have found most useful as a guide in systematic inquiries :

I. "There is but one system, and that is to be read in nature, and was not devised by man. The essential divisions of that system cannot be arbitrary." Agassiz on Classification, p. xix.

II. "There will be no scientific evidence of God's working in nature until naturalists have shown that the whole creation is the expression of a thought and not the product of physical agency." Agassiz' Lake Superior, 1850, p. 195.

Many varieties and subspecies owe no doubt their existence to the influence of exterior physical agents, but all higher divisions may be considered created in concordance with the physical circumstances under which the individuals are destined to live; at least the contrary is not yet proved.

III. Each systematic division may be considered an independent body, whose subordinate divisions or parts may be arranged according to a common consequent plan in each Subkingdom.

Expl.—If, for instance, the presence of a male organ or lungs is considered a character of superiority among Vertebrata, it must be so in the other Subkingdoms also, until the contrary can be proved.

IV. The greatest resemblance between two divisions is always found in the lowest species or groups of a series. The highest species or group in a division is that which differs most from the lowest in the preceding division. Thus only the lowest plants have locomotion and copulation (budding) in common with animals. "The highest plant, as a plant, is that which differs most from animals," Buguoi. The struthious birds are not the highest birds, although most resembling the mammalia.

V. The relation between two divisions may be either direct or collateral*. The first kind may be indicated as superior or inferior, the latter kind of relation as macrosthenic and microsthenic.† Dana has proposed the following terms in place of superior and inferior, viz: Hypertypic (Homo), Alphatypic (Cattarrhina), Betatypic (Platyrrhina), Gammatypic (Strepsirrhina), Hypotypic (Carnivora) Hemitypic or Degenerative (Pinnigrada.)

Expl.—Mammalia and Birds are macrosthenic; Herpethia and

* Milne Edwards' Sur la Classification Nat. des Animaux. An. des Sc. 1844, i. p. 80.

† These terms are used here in a somewhat different sense from that originally proposed by Dana (American Journal of Science, &c., 1863, vol. 36, p. 1.)

Fishes microsthenic; Placentalia and Reptilia are macrosthenic; Aplacentalia and Amphibia microsthenic, &c.

VI. Each Subkingdom is founded on a different fundamental plan, which is modified in an analagous manner according to their manner of feeding and element of habitation.

Expl.—Talpa, Gryllotalpa, Lepidoptera, Birds; Fera, Carabi.

VII. The nervous system affords characters for distinguishing the Subkingdom; but only among Mammalia is it sufficiently known to afford the base for Subclasses, (Gyrencephala, Lissencephala, Owen.) The Androgyna have among Mollusca the greatest number of nodules upon the nervous ring, which may be considered a character of superiority.

VIII. The plan of the circulatory system indicates the limits of the Præclasses, although it may undergo considerable degradations, for instance, in Leptocardii, or even be wanting without the general plan of organization being changed in a considerable degree, as Tæniæ among Platyhelmatæ, Rhizocephala among Crustacea.

IX. The generative organs afford characters indicating relative rank and probably the limits of the classes, but are not yet sufficiently investigated from a systematic point of view.

1. Sexes are separated, with external copulatory organs, which either are a male intromittent organ or an organ of retension, homologous with the locomotive organs.

2. The functions of both sexes are united in each individual. Male organ retractile, *e. g.* Hirudines, Lumbrici; Mollusca androgyna,* Platyhelmatæ.†

3. Sexes are separated, but without copulatory organs. Teliosts, Acephala, Annelida.

4. Hermaphroditism is only a character of specific value. Serranus (Dufossè), Pecten (M. Edw.), Chrysaora (Derbès, Ar. Wright.)

X. The state in which animals produce their young is of the highest importance to distinguish the relative rank, although it rarely agrees exactly with the limits of divisions higher than orders. Not all the Marsupialia are provided with a pouch. Not all the Batrachians have the same manner of development, but still it is one of the fundamental characters of the division.

* The male organ of Pulmonata can scarcely be considered an intromittent organ, as it only serves as an organ of retension, whilst the spermatophores are mutually introduced.

† The Lemniscus of Owen may be considered the male organ.

1. The young are born in a helpless state (often blind) but the parents are able to nurse and educate their progeny. *Educabilia* (Bonap.), *Mammalia*; *Altrices*,* Owen, among Birds.

Among the lower animals nursing is probably replaced by metamorphosis. The animals which are nursed with the greatest care, or undergo the greatest number of phases in their development, may be considered the highest in their respective classes, *e. g.*, *Coleoptera* among *Mandibulata*, *Hymenoptera* and *Lepidoptera* among *Haustellata*.

Metamorphosis through a nurse may be considered as indicating inferiority of the adult state.

2. The young make their appearance in a state of adolescence (freely moving) and need no metamorphosis to reach the mature state. This kind of propagation may be considered a character of inferiority.

Expl.—*Ineducabilia* (Bonap.) among *Mammalia*, *Præcoces* (Owen) among Birds, *Ametabola* among *Mandibulata* and *Haustellata*.

Propagation by budding is a character of inferiority, *e. g.*, *Aphides*, *Tunicata*, *Bryozoa*, *Aculepha*.

XI. The different kinds of food and the manner in which it is seized and prepared afford the principal characters limiting orders and families.

I. *Manducabilia*, which divide the food in morsels.

1. *Zoophaga*, animals which have means of catching and killing other animals; only few divisions are composed of species living exclusively upon animal food. (*Ursus*, *Zabrus*.)

2. *Necrophaga*; feeding upon dead bodies is a character of inferiority and indicates only the limits of families. *Carnivora* are generally considered the highest in their respective divisions, as it requires considerable skill in catching their prey; yet the *frugivorous* and *insectivorous*, *Quadrumania* and *Scansores* are considered superior to the *carnivorous* groups.

3. *Insectivora* and *Frugivora* are very natural groups among *Quadrumania*, *Bats*, *Edentata*, *Scansores*, &c.

4. *Phytophaga*, feeding upon vegetable matter, chiefly leaves, *e. g.*, *Ungulata*, *Lamellicornia*, *Helicea*, which contains the largest terrestrial forms.

* *Gymnogenous*. *Hestogenous* of Newman (*Proc. of the Zool. Soc.*, 1850, p. 46.) These divisions are not analogous to *Placentalia* and *Aplacentalia*, which probably are not represented in birds, unless the habit of *Struthious* birds depositing some eggs for food of the young, may be considered an analogy of *marsupialism*.

II. *Suctorial*. Live either on vegetable or animal juices. *Haus-tellata*, *Rhachiglossata*, *Toxoglossata*, and, according to Swainson, most birds. Agassiz considers the suctorial insects superior to the mandibular. (*Am. Journ. of Science*, 1850, p. 383.)

Cataphages swallow the food entire, as most fishes, *Acephala Actiniæ*.

The teeth are chiefly destined to divide the food in morsels, but are often only prehensile organs. The want of teeth is counterbalanced by the muscular structure of the intestinal channel (Birds), by hard plates in the stomach (*Bulla*, *Gryllotalpa*), or by swallowing purposely gravel for triturating the food (*Myrmecophaga*, *Sthruthio*), or unusually strongly developed salivary glands and liver. The want of teeth is only of generic value,—e. g., *Myrmecophaga*, *Balæna*, *Cirroteuthis*, *Doridopsis*, *Thetys*, *Odostomia*. The teeth are probably always present in quite young animals (e. g., *Balæna*, *Odobana*), and are lost in the adult state. No example to the contrary is as yet known.

XII. According to the elements in which animals live, they are either Terrestrial (Ärial) or Aquatic.

Lungs and gills afford no limits for the higher systematic divisions, but only relative rank.

1. Perterrestrial (*Dana*) live in all stages of their life upon land, and are nearly exclusively pulmonary (*Cyclostoma*).

a. Arboreal or scansoreal, with prehensile organs,—hands, tail, or suckers, (*Quadrupana*, *Bradypus*, *Chamaeleo*, *Hyla*, *Limax*).

β. Rasorial, *Ungulata*, *Gallinacea*.

γ. Cursorial.

δ. Saltatores (*Halmathurus*, *Rana*, *Locusta*, *Strombus*, *Onustus*).

ε. Herpetometra (*Geometra*, *Pedipes*, *Stoastoma*).

ζ. Repentes, *Serpentes*, *Gastræopoda*.

η. Fodientia, *Talpa*, *Gryllotalpa*.

ς. Voliantia (Birds, Bats, most Insects).

Divisions composed of flying animals are always analogous to divisions containing swimming animals. Locomotion in air and water is performed in an analogous manner (Birds, Fishes, Bats, Seals).

2. *Semiterrestrial* animals undergo their first metamorphosis in the water, or are much dependent upon water; *Rana*, *Auricula*.

Amphibious animals are, according to their respiratory organs,

aquatic, but live a long time in the air; Anabas, Land-crabs, Anthocole, Hirudines, Neritina, Littorina.

Endoparasites (Entozoa), living in the juices of terrestrial animals, or burrowing in their tissues, may be considered aquatic animals.

3. *Aquatalia*, animals whose existence entirely depends on water; Fishes, Crustacea, Worms, Branchiferus Mollusca.

Pelagic animals are generally gelatinous, pellucid, and need in most cases no hard covering, as they rarely come in contact with hard bodies; except species living on sea-weeds, which may be considered islanders. They are either *swimming*, as Cephalopoda, Acalepha, Pteropoda, Heteropoda, or *floating*, as Janthina, finless Heteropoda, Sagitta and Salpæ.

"In comparing animals of the same natural group, we always find the terrestrial to be more perfectly organized than the aquatic."—McLeay. Agassiz has treated this question most elaborately in a paper entitled "The Natural Relations between Animals and the Elements in which they live."*

XIII. Zoogeographical provinces and geological periods afford some of the safest guides in discovering natural affinity. Terrestrial and fluviatile animals are often divided according to their habitation in the old and new world, into very natural groups,—e. g., Quadrumana, Scansores, Marsupialia, Edentata, Humivagæ. Nearly all divisions of land and fresh water Mollusca agree with zoogeographical provinces.† The circumpolar regions show no notable difference between species, being inhabited by closely allied species of the same genera.

Swainson has first pointed out that the typical groups in each division are European.‡ The reason cannot be that the European species are more familiar to most authors, but, in reality, animals of the new world have nearly always characters considered to indicate inferiority; for instance, the long tails of American Monkeys and Parrots; greater number of teeth of Platyrrhina. "Tropical forms stand generally highest in their respective classes."—Agassiz, l. c. p. 121. "Species of generally cold climes are inferior."—Dana, Am. Journ. of Science, 1863, p. 330. No mammal with a thumb is found in the northern hemisphere (Kaup). Alf. De Candolle considers the lower plants more widely distributed than the higher ones, but this arises

* American Journal of Science and Arts, ix. 1850, p. 369, and Annals and Mag. of Nat. Hist.

† Mörch, Malacozoologische Blätter, 1859, p. 102. Journal de Conchyliologie, 1865, p. 265.

‡ Europe is in zoogeographical respect limited by Sahara and Himalaya. Palæarctic region of Günther.

probably from the circumstance that lower organisms offer fewer specific characters.

The marine animals are less influenced by the continents than the terrestrial are. Thus the Atlantic coast of the old world has nearly all the genera represented in closely allied species on both sides of America. Many West Indian species are exceedingly difficult to distinguish from East Indian. The same relation is to be seen among species of the faunas of different geological periods. Agassiz* has chiefly shown the relation of the fossil forms to the living, and introduced a particular nomenclature.

Prophetic types indicate the relations between Ichthyosaurus† and Cetacea, or between Pterodactylus and Bats of the present era; but this resemblance is scarcely anything but common analogy, like the relation between Testudo and Dasypus, &c. This expression must therefore be understood in the manner that the Ichthyosauri performed in the Liasic period the same part in the house-keeping of nature as the Dolphins or Seals in the present sea.

Embryonic types (Ag.) indicate the relation between Mastodon and Elephant, Pentaerinus and Antedon, Sertularians and Medusæ.

Hypembryonic types (Ag.) indicate animals with embryonic characters strongly developed, as the webbed hands of Bats and Seals.

XIV. According to the time in which animals seek their food, are several very natural groups established, chiefly characterized by the construction of the eyes and the colors of the body. Ferae, Rapaces, Fissirostres, Lepidoptera are thus divided into Diurnal, Crepuscular and Nocturnal. The latter division may always be considered the lowest in rank.

XV. The different means of protection against attack of enemies or injuries from physical causes, offer often a good guide to distinguish relative rank.

1. Defensive arms, which are also used as offensive weapons: teeth, claws, hoofs, horns, bills, poison-darts, enidæ of Actiniæ,‡ pedicellaria of Echinodermata, aviculariæ of Bryozoa.§

* On the difference between Progressive, Embryonic and Prophetic Types.—Am. Ass. Adv. Sc. 1849. p. 432.

† As these animals have four limbs, the analogy is perhaps still closer to the seals.

‡ The enidæ, or urticating filaments of the Eolidæ, appear to be quasi-fæcal collections of the thread cells of the Hydractiniæ (Str. Wright, Quar. Journ. of Microsc. Science, 1863, vol. 3, p. 52), reminding one of the hair-balls of animals of prey, some Insectivora, as the Cuckoo.

§ F. A. Smith, Öfversigt af Kgl. vel. Acad. Förh., Stockholm, 1865.

2. Strongly developed senses to discover the danger, and swiftness of movement in order to avoid the attack of enemies; nocturnal or spelunchal habits.

3. Hard covering of the skin, as *Dasypus*, *Testudo*, *Ostracion*, shells of *Mollusca* and *Echinodermata*, or spines, as *Erinaceus*, *Hystrix*, *Diodon*, *Murex*, *Echinus*, &c.

4. Forming nests or cells for the protection of the offspring; digging holes, or forming tubes, as the larva of *Phryganea*, or the shell of the female *Argonauta*. The difference between constructions formed by the mouth or by the skin seems not to be very considerable.

5. By imitation of the colors of the ground where they live: moulting polar animals, most Insects; or by shape resembling lifeless bodies, as twigs (*Phasmæ*, larva of *Geometræ*).

6. Great fertility, by which the species is protected from destruction, but is a proof that the individual is not provided with skill to provide for its offspring: *Entozoa*, *Plants*.

The want of hard protective skin or calcareous plates may in general be considered a character of superiority. The greatest number of species with hard covering is found among the lowest classes of the *Vertebrata*: *Reptilia* and *Fishes*. Among *Mollusca* all the *Diatœardia* are provided with a shell or tube. Among *Exophillia* a few (pelagic!) *Heteropoda* and *Onchidiopsis* only are naked.

The *Androgyna* offer the greatest number of naked forms; as *Aplysiæ*, *Gymnobranchia*, *Pellibranchia*, and the only naked terrestrial *Mollusca* (*Limax*, *Veronicella*, &c.) Among *Cephalopoda*, the *Tetrabranchiata*, which are provided with the most-developed shells, are considered the lowest. It seems, therefore, that in general, species which need no hard protecting covering are of a superior stamp, if they are not degenerative forms protected by the means indicated under 6.

Expl.—

1. <i>Limax</i> .	<i>Aplysia</i> .	<i>Octopi</i> .	<i>Holothuriæ</i> .	<i>Bradypus</i> .	<i>Sphargis</i> .
2. <i>Vitrina</i> .	<i>Philine</i> .	<i>Dibranchiata</i> .	<i>Echini</i> .	<i>Mauiis</i> .	<i>Chelonia</i> .
3. <i>Helix</i> .	<i>Bulla</i> .	<i>Tetrabranchiata</i> .	<i>Criuoidea</i> .	<i>Dasypus</i> .	<i>Testudo</i> .

The naked *Mollusca* appear always to be the largest in size in their respective groups.

XVI. The degree of mutual dependence of individuals affords good characters for indicating relative rank.

1. Individuals free, never attached or radiated (*holozoic* Dana).

a. Living in pairs, taking charge of their young.

β. Living in herds ; polygamous (Ruminantia, Gallinacea).

δ. Living together in colonies bound together by instinct. The nursing of the young and the defence of the colony is often purveyed by a sexual individual, which seems to indicate a defective organization of the sexual individuals (Hymenoptera).

γ. Thytoid colonies, composed of individuals united together bodily, and performing various duties ; feeding, generating, defence.

ε. Colonies in which some of the individuals are reduced to organs : Zoites, Zonites, Duges,* Tæniæ, Hydræ, Worms, Acephala.

XVII. According to the form of the body, L. Glaser† has distinguished two principal forms : *involute animals* (as Mammalia, Reptilia, Mollusca), and *evolute animals* (as Birds, Fishes, Insects, Zoophytes). The classes of the former division are always the highest in their respective series, although they externally are of less importance in appearance. The Mole, e. g., looks externally more degenerated than any bird. The same is to be observed relative to Cœcilia and Amphisbœna, in opposition to Fishes.

1. Latero symmetrical animals, with the intestinal generative openings in the median line. Vertebrata, Insecta, Crustacea, Acephala, Cephalopoda, Chitons, have lateral generative openings. All spiral Mollusca have the anus, urethral, generative and respiratory openings lateral, except Onchis, which have only the male organ lateral.

Dana‡ has formed the following nomenclature, according to the position of the locomotive organs : Prosthentic (Birds, Hymenoptera, Lepidoptera) ; Methasthenic (gallinaceous Birds, Coleoptera) ; Urosthentic (Thysanura).

2. Radiated animals are—

a. Free (Anthoidea), in most directions symmetrical (Medusa), or only apparently radiated symmetrical : Echinodermata, Cephalopoda.

β. Dendroid or phytoid forms are always aquatic.

XVIII. According to size, the higher animals offer the largest individuals, and never so minute as the lower ; but the largest species are never the highest in rank in their respective classes. Aquatic and paludestrine animals are always larger than terrestrial or arboreal. Insectivora and Carnivora can never reach

* Conformités Organiques Lam., ed. 2, p. 53.

† L. Glaser, Isis. 1842. p. 6.

‡ Dana, Am. Journ. of Science, 1863, p. 321.

the size of *Phytophaga*. *Enhydra Odobœna*; *Succinea oblonga*, *S. amphibia*.

Among cold-blooded terrestrial animals, the largest species are always tropical, although the largest Mollusea in general are tropical—(*Tridacna*, *Cassis*, *Fusus incisus*, Martyn); this is, however, not the case in each family; thus the largest *Solen*, *Modiola*, *Plagiostoma*, *Pecten*, *Haliotis*, or *Mytilus* are found in sub-polar seas. The Mediterranean, although only a sub-tropical sea, offers species much larger than the truly tropical seas, as *Ranella*, *Pinna*. "Animals whose chief metropolis is in a temperate climate, become smaller when they extend their limits into a warmer region, and *vice versa*."—Sws. on Classification, p. 285.*

XIX. "Multiplicity of organs indicates inferiority in structure."—Owen. Hexapods are inferior to Quadrupeds—Multipeds inferior to Hexapods. Suckers of Echinodermata may be considered the lowest kind of locomotive organs; Polyommatus inferior to binocular.

XX. Color and its various patterns offers some of the most important means of distinguishing species, and even genera. The same color is often common to animals of the most different orders and classes living in the same province.† The land shells in the rainless regions are thus always white. The Trochoidea in the Chilian province are predominately black. The oceanic animals are nearly all bluish and pellucid. Whether the different colors indicate relative superiority or inferiority, is not yet made out. Oken‡ considers the yellow color of flowers to indicate inferiority. The following table shows the concordance of the colors with the form in various families of shells:

1. Spondylus.	Pterocera.		Ranella.	Melo.	Harpa.	Desmoulea.
2. Pecten.	Strombus.	Cypræa.	Triton.	Voluta.	Oliva.	Nassa.
3. Lima.	Rostellaria.	Ovula.	Distorsio.	Yetus.	Ancillaria.	Bullia.

The third line contains genera with unicolor species, comparatively few in number; but nearly every three species are established as a subgenus.

The second line affords genera very numerous in species with a variegated pattern, and very difficult to divide into natural subgenera.

The genera in the first line are composed of species few in number, generally with undulated lines, and often spinous.

* And Jeffrey's British Mollusea.

† Synontological Relations of Lorenz Wiener, Sitzungsbericht, 1858, p. 29.

‡ Oken, Naturphilosophie, p. 188.

ON GREEN OYSTERS.

BY ARTHUR W. E. O'SHAUGHNESSY, OF THE BRITISH MUSEUM.

From Annals and Magazine of Natural History, Vol. XVIII., No. 105.
London, Sept., 1866, page 221.

Pliny tells us of red oysters being found in Spain, of others of a tawny hue in Illyricum, and of black ones at Circeii, the latter being, he says, black, both in meat and shell. Moreover, these black oysters seem to have borne the palm of excellence in ancient times, being mentioned by various writers, amongst whom we may cite Horace; and, in spite of Mucianus, who tries hard to puff the oysters of Cyzicus as "larger than those of Lake Lucrinus, fresher than those of the British coasts, sweeter than those of Medullæ, more tasty than those of Ephesus, more plump than those of Lucus, less slimy than those of Coryphas, more delicate than those of Istria, and whiter than those of Circeii," Pliny records it as an ascertained fact that there were no oysters fresher or more delicate than those of Circeii. So much for *black* oysters, which we have never seen, and do not wish to deal with at present. Green oysters seem to be a more modern invention, and, as far as we can learn, are, in many cases, thoroughbred "young natives"—that is, *Britishers*, which appear to have made a rather unfavorable impression on the palates of our neighbors across the channel.

Some time ago, a considerable excitement was created in France by the story of certain luckless individuals, who, having eaten of poisonous green oysters in the market at Rochefort, suffered accordingly. Upon inquiry, it was found that these oysters came from Marennnes, on the west coast of France. Now, Marennnes has long been famous for green oysters; but, by the united exertions of the Mayor of Marennnes and his Secretary, M. Bourricaud, the fact was elicited that *poisonous* green oysters came from Falmouth, in Cornwall. In a letter to the

"Moniteur" on this subject, M. Bourricaud showed how "the enormously-increased demand for the green oysters of Marennes, so justly renowned for their delicacy, had rendered the oyster banks of that coast insufficient to supply the beds;" how, under these circumstances, it had become necessary to have recourse to Spain, Brittany, England and Ireland; and how the young natives from Falmouth were not deemed presentable until they had been subjected to about six months' sojourn in the company of their French brethren. Coming, after this prefatory information, to the case in point, he related how a certain tradesman, actuated by the lawless desire of premature aggrandizement, had been guilty of selling, in the market of Rochefort, oysters from Falmouth, which had remained only three weeks in the French beds. By a prompt analysis of the remaining individuals belonging to this poisonous batch of oysters, made by M. Cuzent, it was found that an average of "twenty-three centigrammes (about $3\frac{1}{2}$ grains) of salt of copper was yielded by a dozen of these oysters"—a dose which, as M. Crosse remarks in the "Journal de Conchyliologie," is more than sufficient to account for the evil effects which are said to have manifested themselves.

The presence of so extraordinary a product as copper in these oysters was soon accounted for by the discovery that the part of the Bay of Falmouth whence they were brought was in the immediate vicinity of a mine of copper, then in process of working. The waters which continually washed the bank being strongly impregnated with the salts of copper, communicated a similar seasoning to the oysters, which, thanks to their obtuseness of organization, seem to have been very little affected by it themselves, and to have become in some sort acclimatized.

Very different, however, was the effect produced on the unsuspecting dupes of the Rochefort merchant. According to all accounts, it would appear to have been a veritable case of poisoning, although, we believe, fatal consequences were averted; and, in spite of the assurances of M. Bourricaud, that a "complete poisoning" by means of these oysters would be impossible, we agree with the editor of the "Journal de Conchyliologie," that an *incomplete* one is a sufficiently disagreeable affair.

In order to ascertain the presence of copper in the oyster, M. Cuzent recommends that a sufficient quantity of pure ammonia be poured upon the flesh, which will soon declare its poisonous qualities by assuming the dark blue tint which distinguishes ammoniacal salts of copper. Another method is to plunge a sewing-needle into the green parts of the oyster, and immerse

it, so transfixed, in vinegar. In a few seconds the parts of the needle in contact with the flesh will become covered with a coating of red copper reduced to the metallic state. It appears that an oyster in which the green tint is peculiarly clear is especially to be avoided, while those which are of a bluish green color are not only fit to eat, but are considered very choice.

Now, the green tint frequently observable in the oyster has attracted the attention of scientific men from time to time, long before the serious occurrences just mentioned, which took place in the spring of 1862; and it would seem that, in nearly all the cases on record in which fatal consequences have followed their use as an article of food, there is reason to suspect that copper has been the chief cause of the evil.

So far back as the year 1713, mention is made of a certain luxurious supper, given by an ambassador at the Hague, who, in order that no delicacies might be wanting, procured green oysters from England. All who ate of them are said to have been immediately seized with severe colics, and to have been cured with great difficulty. Lentilius, on whose authority this account rests, states that it was afterwards ascertained that the merchant, whom he anathematizes with his whole race, had palmed upon the ambassador some common oysters, tinted with copper, for the true greens.*

Another case is recorded by Dr. Chisholm in the "Edinburgh Medical and Surgical Journal," Vol. IV., p. 400. He was informed by Mr. William Newton, of St. Croix, that some time after the British frigate "Santa Monica" was cast away on the coast of the Island of St. John, (one of the Virgin Islands,) oysters grew on her bottom, which was coppered. Many people ate of those oysters, and, although the consequence was in no case fatal, it was dangerous, and unpleasant in a very great degree, producing cholera and excruciating torment.

With regard to those oysters in which the green tint is not due to any such deleterious cause, but, on the contrary, rather enhances their value as a delicacy, many very different explanations have been offered of the manner in which that color is acquired. It has been said that the water in the artificial beds, remaining stagnant in warm weather, becomes green, and soon communicates the same color to the oysters themselves; and Dr. Johnston, speaking of the French oysters, says that, in order to communicate to them a green color, which, as with us, enhances their value in the market and in the estimation of the epicure, they are placed for a time in tanks or "parks," formed in par-

* Dr. Johnston's "Introduction to Conchology," p. 19.

ticular places near high-water mark, and into which the sea can be admitted at pleasure by means of sluices; the water being kept shallow, and left at rest, is favorable to the growth of the green *Confervæ* and *Ulvæ*; and with these there are generated at the same time innumerable minute crustaceous animalcules which serve the oysters for food, and tincture their flesh with the desirable hue.

In 1820, M. Benjamin Gaillon made a series of observations upon this subject, which he communicated to the Académie des Sciences de Rouen, and which led him to the conclusion that the green color of oysters is due to the absorption of microscopic animalcules allied to the *Vibrio tripunctatus* of Müller, for which he proposed the name of *Vibrio ostrearius*. These creatures he described as gelatinous, linear in shape, pointed at the extremities, rounded in the middle, being also contractile in that part, and charged with a quantity of green fluid. He says that they inhabit the water of the tanks or "parks," in which the oysters are preserved, in such immense abundance at certain seasons of the year, that they can only be compared to the grains of dust which rise in clouds, and obscure the air in dusty weather.

In a résumé of his observations on this subject, which he contributed to the "Journal de Physique," Tome XCI., (1820,) p. 222, he observes that the change of color takes place only in the "parks" or reservoirs of salt water, where the oysters are kept on being brought from the sea. These "parks," which are about 4 feet in depth, 200 to 250 feet in length, by about 50 feet in breadth, are capable of containing from 500,000 to 600,000 oysters: such are those of Marennes, Oléron, Courseulles, Caen, Havre, Dieppe, Tréport, &c. At certain seasons of the year, particularly from April to June, and again in September, the water becomes, in some of these reservoirs, of a dark green tint; even the small stones at the bottom of the tanks are covered with small green points or excrescences. Then, says M. Gaillon, the oysters which are destined to assume the same color are placed, with great care, one by one and side by side, in order that none may rest upon any of the others, and the supply of fresh currents of water is suspended for a longer or shorter period, according to the required intensity of the green.

M. Gaillon rejects the supposition that the change of color is the result of disease, on the ground that, having compared the green oysters with those of the normal tint, he found all the organs quite as healthy in the former as in the latter.

To the opinion which has often been entertained, that the

green color is due to the numerous minute particles of marine plants which either themselves form the food of the oyster or communicate their color to the water absorbed by it, he objects that the plants which most commonly find their way into the reservoirs are the *Ulva compressa* and the *Conferva littoralis*, which are known to turn yellow with age, and which, if macerated and left for several days in jars of salt or even fresh water, will not communicate the least tint of green to the fluid, whereas both the mouth and stomach of the oyster are totally unfitted for such food as *Ulvæ* or *Confervæ*.

By the aid of the microscope, M. Gaillon discovered that the little green excrescences with which the stones at the bottom of the tank were constantly studded were nothing more than a heap of the tiny animalcules which filled the water in myriads, and which, when thus collected together in a lump, become visible to the naked eye. He says that, on placing a drop of the water under the microscope, he perceived thousands of *Vibrios* sporting about with every possible kind of motion—sometimes with a sudden jerk or impulsion forwards or backwards, sometimes spinning round on their own axis, like the needle of a compass, sometimes standing straight upon one end, or darting off with astonishing velocity at some other animalcule, and sticking one of their pointed extremities into him, as if it were a lance.

That the green color which makes its appearance in the oyster is really due to the absorption of these living atoms, M. Gaillon has expressed his firm conviction, both in the “*Journal de Physique*,” above cited, and in the “*Memoirs of the Linnæan Society of Calvados*.” He assures us that as soon as the fresh water is again allowed to have free access to the reservoir, the oysters gradually lose both the green hue and the altered flavor which accompany it, although they are sometimes so thoroughly impregnated with the green matter, that they do not quite lose it even in the winter, consequently long after the disappearance of the *Vibrios*; there is, however, a gradual and sensible diminution in the tint. It is this duration of the green color so long after the animalcules have ceased to exist, says M. Gaillon, which accounts for the assertion that green oysters may be obtained all the year round. Those, he observes, who have never witnessed the intensity of the color at certain seasons of the year would probably designate as green oysters any which showed the faintest remnant of that tint. According to all observers, it is the region of the branchiæ or gills which exhibits this peculiarity the most strikingly. Now, M. Gaillon assures us, from having examined these organs with the micro-

scope, and compared the orifices of the tubular filaments with the size of the animaleules, that the latter could not possibly enter the system of the oyster in that region.

Perhaps one of the most significant facts recorded by M. Gaillon, as the result of his laborious observations, is that, at different seasons of the year, the water of the oyster "park" presents very different tints, being sometimes brown, at others green or yellow, both the brown and the yellow being equally the result of the abundant presence of microscopical animaleules of a different species from the green *Vibrio ostrearius*. The brown species, we are told, has as striking an effect on the color of the oyster as the green one, and greatly improves its flavor; whereas the yellow are considered prejudicial.

With reference to these so-called animalcules, we need scarcely state that the atoms hitherto referred to the genus *Vibrio* are now recognized as being of a vegetable nature. The species *ostrearius* appears in the last edition of Pritchard's work on the Infusoria as a *Navicula*.

In spite of the detailed observations and experiments of M. Gaillon, we find M. Valenciennes remarking, at the commencement of a paper on the same subject in the "Comptes Rendus de l'Académie des Sciences" for 1841: "On sait combien les explications données jusqu' à ce jour sur la coloration des huîtres laissent encore à désirer." The object of this paper is to prove that the green color is due to *an animal matter which must be quite distinct from all green organic substances hitherto known*.

M. Valenciennes says that the only externally visible organs which display this color are the four leaflets of the branchiæ. On lifting the upper part of the mantle, the inner surface of the labial palps alone appear colored; and on extending the examination to the internal organs, the intestinal canal beyond the stomach is seen to be of a bright green color. The liver is of a blackish green tint instead of the usual red; but neither the muscles, heart, nor even the juices of the body exhibit any change of color.

According to M. Valenciennes, the coloring matter offers nothing remarkable when viewed under the microscope; but when examined chemically it is found to possess certain properties which led him to the conclusion above quoted. His observations were made on the *large green oysters of Marennes*; but he says that like results have followed the application of the same chemical tests to the so-called *green oysters of Ostend*, which are less strongly colored.

M. Dumas made some experiments in order to discover if the green matter might not owe much of its color to Prussian blue

The result is stated to have been in the negative. However conclusive the observations of M. Valenciennes may appear, Prof. Bizio, in a memoir read before the Institute of Venice in the year 1845, calls attention to the fact that some ten years previously he demonstrated the existence of copper in the branchial organs of the *Ostrea edulis*, at the time when a similar discovery was made with reference to the spire of the *Murex*. He says that he then hinted at the possibility of the green color observed in the branchiæ being the effect of the copper which enters into the composition of that organ, and that he has been confirmed in that opinion by these very experiments of M. Valenciennes, which, he says, tend to make it evident to anybody who knows anything about copper, that the coloring matter is neither more nor less than that metal combined with, and disorganised in the organic substance of the oysters.

It might be somewhat tedious to the reader were we to give a detailed account of the experiments made by Prof. Bizio with a view to prove this assertion. These experiments, he tells us, were begun in June, and continued till the month of September. They appear to have been conducted with great care and precision, and we would refer those anxious to pursue the investigation of this curious and interesting subject at greater length than we have space to do at present, to Prof. Bizio's paper, which will be found in the fourth volume of the "Transactions" of the above named Academy.

Suffice it to say that ammonia, which was one of the principal tests employed by M. Valenciennes in his experiments, is also the agent on which Prof. Bizio most relies; and the results recorded by M. Valenciennes as having been produced by ammonia on the colored portions of the oysters, were, in part, due to the presence of copper.

It is remarkable that, while M. Valenciennes particularly mentions the presence of the coloring matter in the intestinal canal and liver of the oyster, Prof. Bizio's remarks refer only to the branchiæ. Whether he would imply that the green color, wherever it shows itself in the oyster, is due to the presence of copper, is a query we are not prepared to answer, but should like very much to have answered for us, as, bearing in mind the cases at Rochefort, we cannot but think this green oyster question rather a serious one.

Fortunately there appears to be very little call for green oysters in the English markets, and the great bulk of them are, we believe, shipped over to France. Perhaps it is a good thing they are so sparingly appreciated in this country.

It is singular that so little should be definitely known of the

cause of a phenomenon which takes place in a creature so easily accessible to observation as the oyster. However, public attention has lately been so frequently drawn to this "illustrious bivalve," that we have no doubt there will soon be some new light thrown upon this subject. We understand that Mr. Frank Buckland, in reply to a question addressed to him by the House of Lords some time since, stated that a professional chemist, to whom he had submitted specimens of the green oyster, had already found out the true cause of the coloration.

This, whatever it be, does not seem, however, to have been as yet made public. Mr. Buckland himself seems to incline to the opinion that a growth of green weed of some kind or other during certain times of the year only is the cause. It is now well known that we have real green oysters, or rather *green-bearded oysters*, in England. These have been long exported to various countries, where the taste for such delicacies was more advanced than with us. It would seem that the greenness in the oysters from the river Roach in Essex is, however, entirely confined to the beard. The fact that another river (the Crouch), running into the Roach, possesses oysters with *white beards*, only renders the whole question all the more curious and puzzling.

Meanwhile, until the actual properties of green oysters which are neither plucked from the keels of ships nor fished up near the copper mines at Falmouth shall be discovered, we advise any of our readers who are at all inclined to be nervous on the subject to remember the valuable test afforded by ammonia, and add a small bottle of it to the usual pepper and vinegar accessories, to be used in a case of doubt,—though, if they have a mind to eat the oyster in case their suspicions should prove groundless, we would recommend the simple ordeal of the sewing needle as the more suitable.

ON THE GENUS FULGUR AND ITS ALLIES.

BY THEODORE GILL, M. D.

Attention having recently been drawn to the genus *Fulgur*, or *Busycon*, all the recent and fossil species at my command were examined, and the results of such examination are herewith submitted. It has now been definitively shown by Dr. Stimpson that *Fulgur* is a true representative of the Buccinidæ, and related to *Chrysodomus* (*Neptunea*, Bolt), and kindred forms, the animals agreeing in all essential characters; nor is there any distinction exhibited by the shell alone to contradict the teachings of Anatomy. The genus, as represented by the types *F. carica* and *F. canaliculatus*, appears, however, to be divisible into two natural genera, which are indeed very closely related, but exhibit diversities in characters which with less reason have been employed to distinguish other genera; the two genera so indicated are therefore adopted and characterized. In order to exhibit the affinities to, as well as contrasts between a closely allied form which has been billeted from place to place, and very widely separated from its kindred, the diagnosis of the genus *Tudicla* is likewise offered.

Perhaps the *Fasciolaria* (*Lyrosoma*) *sulcosa*, Conrad (*Fusus sulcosus*, olim), may prove to be nearly related to *Fulgur*. Mr. Conrad has referred the "subgenus" to *Fasciolaria*, with the following characters:

"Subpyriform; ribbed, beak narrow and produced, slightly recurved; one long, very oblique plait at the angle of the columella."

As the conchological distinction hitherto made between *Fasciolaria* and *Fulgur*, or *Busycon*, is the presence in the one of several oblique linear "plications," and in the latter of a single very oblique plait at the angle or inferior margin of the columella, the reasons for referring the species in question to *Fasciolaria* are not

evident, as the only character assigned which distinguishes it from *Busycon* is the "ribbed" surface. Examination of specimens, however, show that the nucleus is depressed helicoid, and the columella straight towards the front: the whorls are longitudinally plicated and crossed by revolving ribs. The general form, the whorls being angular and plane behind and ventricose below the angle, as well as the marginal columellar fold, nevertheless appear to indicate affinity to *Fulgur*.

It is necessary to remark, in conclusion, that the notation indicating the comparative value of Synonyms proposed by Strickland has been adopted;* that reference has been made only to such authors as have modified the genus or its characters, and that when a specific type has been mentioned, it is indicated in parentheses after the reference to the authority. Finally, the laws of nomenclature originally sanctioned by the British and American Associations for the Advancement of Science have been obeyed, although in some respects repugnant to the views entertained by the author.

FULGUR Montfort.

- < *Busycon*, Bolt, Mus. Bolt, 1798 (undescribed).
- < *Busycon*, Mörch, Cat. Yöldi I., 1852, p. 104.
- < *Busycon*, Adams, f. Gen. Moll. I., 1853, p. 151.
- < *Busycon*, Stimps., Am. Journ. Conch. I., 1864, p. 60.
- = *Fulgur*, Montf, Conch. Syst., II., 1810, p. 502, (*carica* and *perversus*).
- < *Fulgur*, Gray, Proc. Zool. Soc., 1847, p. 135; Guide, 1857, p. 11.
- Murex*, sp. Linn., &c.
- Pyrula*, sp. Lam, Petit, &c.

Etym. *Fulgur*, lightning; in allusion to the coloration indicating periods of increase simulating streaks of lightning.

Animal rather small, retractile with its operculum within the shell for about a third of a revolution from the aperture. Radula with the rachidian tooth 5—6 dentate; lateral 5—6 dentate, (*F. carica*; *perversus* fide Stimpson).

Operculum with the nucleus apical.

Shell with a simple very thin periostraca; with little raised revolving lines; pyriform, with the whorls wound tightly round the axis, leaving no umbilicus, angular behind, with the upper

* = equal to; < indicates a more extended group; > a more restricted one.

surface shelving towards the angle; and the whorls below the angle ventricose and thence gradually contracted and terminating in a moderately elongated canal, generally little or no longer than the aperture, concurrent with and proximal to the siphonal fasciole, and correspondingly tortuous. Siphonal fasciole coincident with the columellar plait: spire variable in evolution, with a papillary nucleus; sutures plane; aperture rhombovate; outer lip in youth striated within; columella covered with a thin callous coat, decidedly and regularly concave, and with a wide oblique marginal fold.

The genus *Fulgur* is thus restricted to species destitute of a sutural canal and ciliated periostraca. It was originally established by Montfort for *F. eliceans* [= *F. carica* and *F. perversus*], and was distinguished by the armed spire and fold of the columella. It embraces only the typical species of the genus *Busycon* of recent authors. From it must be eliminated in the first place the subgenus *Taphon* Ad. f.,* established for the *P. striata*, Gray, and which evidently has no affinity to *Fulgur*. The "*crassicauda*, Phil.," is at least very closely allied to the "*Hemifusus tuba*, Gmel.," of the same authors.† Of the other species *B. canaliculatum* is transferred to the genus *Sycotypus*. *B. Kieneri*, Phil., probably represents a monstrosity of *F. perversus*, and has lately received a new name (*B. gibbosum*) from Mr. Conrad.‡

The three recent species herein admitted appear to be well entitled to such rank; the *F. coarctatus* is, however, little known, and the identification and characters are accepted solely on the data furnished by Petit, as I am not able to consult Sowerby's description at present. The habitat is said, with doubt, to be Florida; it certainly requires confirmation; and the species itself, although apparently very distinct, may be accepted for the present with reservation.§ The *F. carica* and *F. perversus* inhabit different geographical areas, which, however, overlap. While *F. carica* is abundant on the eastern coast south of Cape Cod, the *F. perversus* is unknown so far north, but occurs along

* Op. cit. i., p. 151.

† Op. cit. i., p. 83. The identification of the species in question has been made by M. Petit de la Saussaye.

‡ A dextral specimen of *Fulgur* in the writer's collection exhibits the same gibbous revolving ridge, and appears to be referable to *F. carica*.

§ It may be recalled that the young of *F. carica* exhibits a similar relatively-elongated canal, and possibly the *F. coarctatus* may represent a form of that species in which the characteristics of the young have been abnormally persistent; the latter, however, is much more ventricose than such young.

the coast of North America, southwards at least as far as Yucatan,* where it is very common.

As doubt is sometimes entertained whether *F. perversus* is not a variety of *F. carica*, the writer examined the embryos in the ovicapsules of *F. carica*, and, among over 500 specimens, no sinistral example was detected. The direction of increase seems, therefore, to be coincident with structural characters in those species, and consequently of specific value.

Several of the extinct species are accepted solely on the authority of Mr. Conrad, no specimens of *F. maximus*, *F. scalarispira* and the eocene species being at present accessible. Of those seen by me, I have ventured to refer to the *F. contrarius*, the *B. adversarium*, Conrad, and am also much inclined to consider both identical with *F. maximus*. The two forms differ only in the direction of growth; but, as that character has been found constant in the living representatives of the genus, it has been deemed advisable, for the present, to retain the two as distinct. It may be here remarked that observers often urge that a sinistral form is more obliquely wound than a dextral one; such appearance, however, is generally illusive, the eye being unaccustomed to reversed shells; the reflection of a reversed form, as seen in a mirror, corrects the impression, and renders more easy the comparison of sinistral with dextral shells.

Although the views of Mr. Conrad have, from a certain necessity, been adopted in some cases, I have had no hesitation in refusing to admit such a nominal species as "*Busycon striatum*,"† as no character has been given to distinguish it from the young of other species of the genus, nor probably can any satisfactory diagnosis be given; the "species" has been based on a specimen little more than an inch long.

The diagnosis of the genus by Montfort was quite satisfactory; the armature of the spire, mentioned as a generic character, is, indeed, not common to all the species; but the introduction of that character by Montfort was legitimate, in view of the materials at his command. His figure, though very rude, is characteristic, and represents the columellar fold, which more artistic figures have failed to exhibit. His figure illustrates *F. carica*, but he has confounded under the name *F. eliceans* both *F. carica* and *F. perversus*, and maintained that the dextral shell was perfectly identical specifically with *F. perversus*.

The genus, after long neglect, was revived by Dr. J. E.

* I have examined a number of specimens collected in Yucatan by Mr. Arthur Schott.

† Conrad Am. Journ. Conch, 1866, p. 69, pl. 3, f. 8.

Gray, and has been retained by him in his "Guide," (1857), in which he has referred it to the Cassidulidæ, giving, as characters, "shell like *Cassidulus*,* [= *Melongena*,] but spire shorter; last whorl very large; mouth very open. Teeth? Operculum very small, ovate or claw-shaped."

F. canaliculata and *F. carica* being the only species enumerated, the characters assigned to *Fulgur* might, with perfect propriety, be transferred to "*Cassidulus*" *melongena*, the type of "*Cassidulus*," as distinguished from *Fulgur*! It might, therefore, be supposed that some transposition of diagnoses had been made, but other species enumerated as *Cassiduli* forbid the supposition. However this may be, the diagnosis of *Fulgur*, cited, is neither applicable to the species, nor is a distinctive generic character introduced, and finally, *Fulgur* does not belong to the family Cassidulidæ even, but to the Buccinidæ.†

Under the name of *Pyrula*, all the living species of the genus *Fulgur* and *Sycotypus* were enumerated by M. Petit de la Saussaye in a valuable memoir on the Lamarckian *Pyrulæ*,‡ and the limits of the group embracing those two genera were well appreciated, although the distinguishing characters were not given. The name *Pyrula* cannot, however, be retained for either genus, as Lamarck mentioned, as the type of his genus in establishing it, the *P. ficus* of Linnæus, and no other species; and, in accordance with the law of priority, the name is only applicable to the group represented by that species, as has been perceived by Gray, Woodward, &c.

A list of the known species of the genus is now submitted.

1. *F. CARICA*.

Murex aruanus, L. (misnomer) S. N., 1766, p. 1222.

Murex carica, Gmel., Syst. Nat. Linn., 1788, p. 3545; Dillw., Cat. ii., 1817, p. 722.

Fulgur eliceans, Montf., Conch. Syst., ii., 1810, p. 503, fig.

Pyrula carica, Lam., An. sans Vert., vii., 1822, p. 138.

Pyrula candelabrum, Lam., An. sans Vert., vii., 1822.

Pyrula aruana, Desh. in Lam., An. sans Vert., 2d ed., ix., 1843, p. 449, 505.

Pyrula Kieneri, Phil.

Busycon spinosum, Conr., Proc. Ac. N. Sc. Phil., 1862, p. 583.

Recent.—East coast U. S., southward of Cape Cod.

* *Cassidulus* is an erroneous substitution for *Cassidula*, the name introduced by Humphrey.

† Dr. Gray, however, was excusable in referring *Fulgur* to the Cassidulidæ, as the characters of the animal were unknown till revealed by Dr. Stimpson.

‡ Petit Journ. Conch., III., 1852, pp. 140—159.

2. F. PERVERSUS.

Murex perversus, L. S. N., 1766, p. 1222.

Pyrrula perversa, Lam. An. sans Vert., vii., 1822, p. 137.

Busycon gibbosum, Conr., Proc. Ac. N. Sc. Phil., 1862, p. 286.

Recent.—East coast N. A., south of Cape Hatteras.

3. F. COARCTATUS.

Pyrrula coarctata, Sowb., App. Cat. Tankerville, p. 17, (fide Petit;) Petit, Journ. Conch., 1852, p. 145, 155, pl. vii., f. 3.

Recent.—Florida?

4. F. FILOSUS.

Busycon filiosum, Conr., Proc. Ac. N. Sc. Phil., 1862, p. 286.

Mioc.—Yorktown, Virginia.

5. F. MAXIMUS, Conr., Tert. Foss., U. S., (1839,) pl. 47.

Miocene.

6. F. CONTRARIUS, Conr., Am. Journ. Sc., xxxix., 1840, p. 387.

Busycon perversum, Tuomey and Holmes, Plioc. Fossils S. C., 1855, p. 145, pl. 23, fig. 3.

Busycon adversarium, Conr., Proc. Ac. N. Sc., Phil., 1862, p. 560, 584.

Mioc.—N. and S. Car.

7. F. SCALARISPIRA.

Busycon scalarispira, Conr., Proc. Ac. N. Sc. Phil., 1862, p. 584.

Mioc.—Shiloh, Cumberland County, N. J.

8. F. TUBERCULATUS, Conr., Bull. Nat. Inst., i., 1842, p. 185;* Tert. Foss., pl. 46, f. 2.

Mioc.—Maryland.

9. F. FUSIFORMIS, Conr., Bull. Nat. Inst., i., 1842, p. 187.

Mioc.—Maryland.

10. F. CARINATUS.

Busycon carinatum, Conr., Proc. Ac. N. Sc., Phil., 1862, p. 286.

Mioc.—Virginia.

* Not described in Bulletin.

11. F. SPINIGER, *Conr.*, *Journ. Ac. N. S.*, *Phil.*, n. s. i., (1849,) p. 207.

Fusus spiniger, *Conr.* op. cit., i., (1848,) p. 117, pl. ii., f. 32.

"*Oligocene*."—Vicksburg, Miss.

12. F. NODULATUS, *Conr.*, op. cit., i., (1849,) p. 207.

"*Oligocene*."—Vicksburg.

SYCOTYPUS, Gill ex Browne.

= *Sycotypus*, Browne, *Nat. Hist. Jam.*, 1756, p. 406, (*canaliculatus*.)

> *Pyrula*, Petit., *Journ. Conch.*, 1852, p. 142, 144, (*canaliculatus*.)

Pyrula, sp. Lam., &c., *Busycon*, sp. Mörch, *Ad. f.*, Stimpson, &c.

Etym. Σύζον, fig.; τῦπος, form.

Type.—*S. canaliculatus*.

Animal rather small, retractile, with its operculum within the shell for about a third of a revolution from the aperture. *Radula* with the rachidian tooth 3-dentate; lateral 4—5-dentate (*S. canaliculatus*, *S. pyrum*, fide Stimpson.)

Operculum with the nucleus apical.

Shell with a ciliated periostraca; with little raised revolving lines; pyriform; the whorls wound tightly round the axis, leaving no umbilicus, angular behind, with the surface shelving towards the angle; below the angle ventricose and thence gradually contracted and terminating in a moderately elongated canal (generally somewhat shorter than the aperture) concurrent with and adjoining the siphonal fasciole, and correspondingly tortuous; spire variable in evolution, with a papillary nucleus; suture canaliculated; siphonal fasciole coincident with the columellar fold; aperture rhombo-ovate; outer lip in youth striated within; columella covered with a thin callous coat, decidedly concave, and with a wide marginal fold.

The genus *Sycotypus* is extremely closely related to *Fulgur*, but the living species are constantly distinguished by the associated characters of a canaliculated suture and a ciliated periostraca. The extinct species of the same form having a channelled suture may be inferred to have possessed the same association of characters; some slight difference exists, however, in the solidity of the shells and especially in the armature of the angle which has induced Dr. Stimpson to believe that the indications as to generic differentiation afforded by the recent species are contradicted, and it must be admitted that there is a very wide difference be-

tween adults of *S. pyrum* and *S. coronatus*; if young specimens of those species are examined, however, the differences are found to be comparatively unimportant. It may be remarked that in early youth the shells of all the species of the genus are very similar, all having the whorls angulated and crenulated, while the whorls themselves are more or less evolved behind the suture. But at an early period a deviation takes place in several types.

The *S. canaliculatus* and its allies continue the normal plan of growth through life, only losing the crenulated margin of the angle, while on the one hand, in *S. coronatus* and its kindred, the crenulated margin is soon developed into a nodose or dentate one which is continued to maturity; on the other, in *S. elongatus* not only is the crenulation of the ridge soon discontinued, but the ridge itself becomes obsolete, the whorls at the same time become somewhat more exposed. Finally, in *S. pyrum* as in *S. elongatus* the crenulations and ridge are soon lost, and the latter is even entirely obliterated in the end, but the whorls in progress of growth encroach more and more on the preceding, so that in the adult the form of *Pyrula* (*ficus*, &c.) is simulated so exactly that the two types can only be distinguished by structural characters, such as the periostraca, channelled suture, plicated columella, sculpture, &c.

As the name *Sycotypus* of Browne is retained for this genus, notwithstanding the claim of it for the genus *Pyrula*, Lam., an explanation of such course is demanded.

As Browne's work is accessible to few, his remarks on *Sycotypus* are here reproduced.*

"The *Sycotypus* or Fig-shell comes next in order, having its aperture in a line with the axis, and terminated in a narrow produced bill like the foregoing; [*Purpura*, Browne = *Murices* sp.] but it is neither lipped nor toothed, and stretches commonly from a large spiral main. The opening of these shells runs generally about two-thirds of the whole length, and the body, which is roundish and swelling, terminates in a moderately prominent apex.

"*Sycotypus* 1. *Tenuis substriatus et leviter tuberculatus*.

"The smaller hairy Fig-shell."

Such is the description of the type which has been identified with *Pyrula* by Dr. J. E. Gray! *Sycotypus* of Browne has a "narrow produced bill," while *Pyrula* has a broad patulous one, the one has an aperture about two-thirds of the whole length, while the other has one extending nearly the whole length; the one is slightly tuberculated or crenulated and "hairy," while the other is unarmed and the mantle being partly reflected over

* (Browne, Civil and Nat. Hist. of Jamaica, 1756, p. 406.)

the shell, the latter is of course not "hairy;" in other words, every character which is not common to almost all forms decidedly opposes the identification of Dr. Gray, and we can only suppose that the gentleman completely ignored the description and identified it by means of *part* of the *name*, overlooking that part which negated it!

It has been deemed advisable, in view of the perfect concordance of Browne's notice with young specimens of *S. canaliculatus*, to retain his name for the genus, but had another been given to it, we should not have felt justified in so doing. As *Sycotypus* of Gray is merely a synonym of *Pyrula*, Lam., no existing genus bears the name, and although in most cases the employment of names that have already been used in another sense is inadvisable, in this it may be justifiable.

The following species are members of the genus *Sycotypus*. The *S. canaliferus*, *S. incilis* and *S. alveatus*, are not at present accessible for autopsy and are adopted solely on the authority of Mr. Conrad. To the list of doubtful related species must be added the *Cassidulus Conradii*, Tuomey and Holmes, (Plioc. Fossils S. C., p. 147, pl. 29, f. 4).

a.

S. CORONATUS.

Fulgur coronatus, Conr. Bull. Nat. Inst., i. p. 187.

Miocene.—Maryland.

S. RUGOSUS.

Fulgur rugosus, Conr. Proc. Ac. N. Sc. Phil., i. 307.

Mioc.—Md.

b.

S. CANALIFERUS.

Busycon canaliferum, Conr. Proc. Ac. N. Sc. Phil., 1862, p. 560.

B. carolinense, Conr. op. cit. 1862, p. 584.

Mioc.—N. and S. Carolina.

S. INCILIS.

Fulgur incile, Conr. Am. Journ. Sc., xxiii., 1833, p. 343.

Mioc.—Virg., (Yorktown.)

S. ALVEATUS.

Busycon alveatum, Conr. Proc. Ac. N. Sc. Phil., 1862, p. 583, Am. Journ. Conch., ii., 1866, p. 68, pl. 3, f. 7.

Mioc.—Md., (St. Mary's River.)

S. CANALICULATUS.

Murex canaliculatus, L. Syst. Nat., ed. 12, p. 1222.

Pyrula canaliculata, Lam. An. Sans Vert., vii., 1822, p. 137.

Recent.—East Coast U. S., northward to Cape Cod.

c.

S. PYRUM.

Bulla pyrum, Dillw. Cat., i. 1817, p. 485.*Pyrula spirata*, Lam. An. Sans Vert., vii., 1822, p. 142.*Fulgur pyruloides*, Say, Journ. Ac. N. Sc. Phil., ii. 237.*Busycon plagosum*, Conr. Proc. Ac. N. Sc. Phil., 1862, p. 583.*Recent*.—Gulf of Mexico and East Coast U. S., northward to Cape Hatteras.

d.*

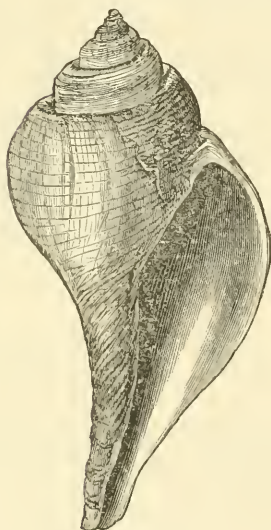
S. EXCAVATUS.

Fulgur excavatus, Conr. Am. Journ. Sc., xxxix., 1840, p. 387, (Fossils Tert. U. S., pl. 45, f. 12.)*Cassidulus carolinensis*, Tuom. and Holmes, Plioc. Fossils S. C., 1855, p. 147, pl. 30, f. 1.*Busycon excavatum*, Conr. Proc. Ac. N. S. Phil., 1862, p. 560.*Busycon carolinense*, Con. Ib., p. 560, (not 584.)*Mioc.*—N. Car., (Duplin Co.)

S. ELONGATUS, Gill, n. s.

Mioc.—N. Car.

SYCOTYPUS ELONGATUS, Gill.



Description.—Shell fusi-pyriform, with seven whorls, the spire much evolved and forming more than a fourth of the total length; with the posterior angle obsolete on the last two whorls, which are consequently convex or rounded; sutural channel moderate, little deeper than wide, triangular in section, with the external wall inclining regularly inwards from the defining angle, and forming an acute angle with the inner wall; surface with rather broad revolving raised lines, which on the body are faint except on the constricted portion, but on the spire are very distinct; first whorls with the angle moniliform.

* In this group the channel, instead of being bounded on both sides by vertical walls, slopes regularly inwards from the external bounding ridge.

Dimensions.—Length of specimen 137 mill.; of spire 31 mill.; greatest width 66 mill.; width of aperture 33 mill.; angle of divergence 80°.

Observations.—This species is represented by a single specimen in the collection of the Smithsonian Institution, and was presented by Prof. S. S. Haldeman, who obtained it from a Mr. Hodge, of North Carolina. It is most closely related to the *S. excavatus* (Conrad) but is at once distinguishable by its more evolved spire, the flatness and striation of the whorls above the angle, and the comparatively shallow sutural channel; the raised revolving lines are also broader and more approximated.

It is possible that this species may have been confounded with the "*Cassidulus carolinensis*" of Tuomey and Holmes,* but the figure published by those authors happily permits the identification of the individual illustrated with the *S. excavatus*. It is unnecessary to compare the present with any other species (if the descriptions or comparisons are correct), as it belongs to a group of which the one described and *S. excavatus* are the only known American species. Its slender form and elevated spire recall to mind the *Fasciolaria tulipa*.

TUDICLA Link ex Bolten.

- < *Tudicla*, Bolt., Mus. Bolt. 1798 (*spirilla*).
- = *Tudicla*, Link, Besch. Nat. Samml. Rostock, iii. 1807 p. 120 (*spirilla*).
- < *Tudicla*, Ad. f., Gen. Moll. i. 1853, p. 151.
- = *Busycon* (*Tudicla*) Mörch, Cat. Yoldi i. 1852, p. 104.
- = *Haustellum*, a, Schum, Ess., 1817, p. 213.
- = *Pyrella*, Swains., Malac, 1840, p. 213.
- = *Spirilla*, Sowb., Jr., Conch. Man., 1842, p. 243.
- = *Spirillus*, Sowb., Jr., op. cit., p. 306.
- = *Murex* (*Pyrenella*), Gray, Guide Moll. B. M. i., 1857, p. 11.

Shell with a thin simple periostraca, tenui-pyriform, the whorls wound tightly round the axis, leaving no umbilicus; with the whorls convex above the posterior angle; below the angle somewhat ventricose, abruptly contracted and attenuated into a narrow canal, which is much longer than the aperture; siphonal fasciole developed at the terminal half of the siphonal canal, which is consequently tortuous; spire depressed, with a papillary

* These authors, for some inscrutable reason, have referred to *Cassidulus* the species above alluded to and the *Sycotypus pyrum*, while in "*Busycon*" they retain the species of *Vulgur* and two species of *Sycotypus* of the type of *S. canaliculatus*.

nucleus, and a trenchant angle in the young; aperture oblong rhomboid; outer lip in youth striated within; columella with a callous deposit in front, forming a plate, convex in front and with a well-defined fold.

This genus, if we may judge from the shell, is decidedly most nearly related to *Fulgur*, and may in brief be described as a *Fulgur* with abruptly contracted whorls, trenchant at the angle (in the young), depressed spire, and convex intracarinal surface. In the texture of the shell, the columellar fold, the tortuous canal, and the papillary nucleus, the genus agrees with *Fulgur*, and has even been united with that genus by so rigid an analyst as Dr. Mörch. The *F. coarctatus* Sowb. lessens the gap between *Fulgur* and the genus in question. Yet Dr. J. E. Gray, whose differentiation of genera is often carried to an extreme, treats the type as a *Murex*! giving to it however, in 1857, the new sectional name *Pyrenella*, which is doubtless a substitution, through *lapsus memoria*, for *Pyrella*. He claims for *Murex* "shell ovate; spire short, with three or more rounded or spinose varices on each whorl; mouth ovate; canal elongate, tubular, spinose externally." As his "*M. Spirilla*" has not a "shell ovate," nor "three varices on each whorl," nor "mouth ovate," nor "canal tubular, spinose externally," we are left to wonder why it has in this last, as in all the other memoirs of Dr. Gray, been referred to *Murex*. We are indeed told that it has "varices rudimentary, unarmed," which, though somewhat contradictory to the diagnosis, might be accepted as a modification; but by the term rudimentary is generally understood a development, however faint, of the character with regard to which the term is used. In the present case, cognizance can be taken of the "varices" only by the eye of faith, for they are certainly not evident to the physical one. Dr. Gray may, however, claim that he only followed Schumacher, whose work was published in the year 1817.

It will be observed that the genus is restricted to the *T. spirilla*. The so-called *Fasciolaria porphyrostoma*, Ad. and Reeve, referred to the genus by the Messrs. Adams, appears indeed to be closely related to it, but the subfusiform shell, with the concave upper surface of the whorls, coronated angle, suboval aperture, and the regular concavity of the columella, appear to indicate that it should be considered as the type of a distinct genus, which he named *Streptosiphon*.

ON THE SYSTEMATIC POSITION OF BUCCINUM ALTILE AND B. ESCHERI.

BY THEODORE GILL, M. D.

While examining the collection of Tertiary fossils in the Museum of the Smithsonian Institution, I was at a loss to appreciate the affinities of the miocene *Buccinum altile* or *Tritia altilis* of Conrad. Further study of the species rendered it probable that it represented the type of a genus hitherto unrecognized, and that the *Buccinum Escheri* of Mayer, from a nearly contemporaneous formation in France was congeneric with it; the following exposition of the characters of the genus are therefore submitted.

PTYCHOSALPINX, Gill.

Buccinum, sp. Conrad, Mayer.

Tritia, sp. Conrad.

Etym. Πτεῖς (ὑγρός) fold; σάλπιξ, quasi *Buccinum*.

Type.—*P. altilis*.



Shell ovate, buccinoid, with the whorls regularly rounded and ventricose; the spire moderate (about as long as aperture;) furnished with equal revolving linear ridges, siphonal canal very short, very obliquely twisted, and concurrent with the siphonal fasciole; *aperture* rhomb-ovate, oblong; labrum entire, not sinuous, smooth within; columella inversely sigmoidal, concave near the middle, with a very thin callous deposit, and with a revolving marginal linear plait in front.*

This genus is related to *Buccinum*, with which its species have been confounded, but differs in too many respects to be properly associated with *B. undatum* and its allies in a natural genus; it

* It may not be superfluous to add that there is no posterior transverse columellar fold.

is distinguished from *Buccinum* as represented by the type named, by the more oblique canal and its concurrence with the siphonal fasciole,* the linear fold in front of the columella, the esinuate labrum as well as by the sculpture. The American species have recently been referred to *Tritia*, a subdivision of *Nassa*, but probably through inadvertence. The known representatives of the genus are extinct and characteristic of the later Tertiary formation, one being found in the Miocene beds of Yorktown, Virginia, and a second in the Upper Tertiary beds at Monthelan in Touraine, (France.)

1. PTYCHOSALPINX ALTILIS.

Buccinum altile, Conrad. Tert. Foss., p. 19, pl. iv., f. 6.

Tritia altilis, Conrad. Journ. Ac. N. S. Phil., 1862, p. 562.

2. PTYCHOSALPINX MULTIRUGATA.

Buccinum multirugatum, Conr. Am. Journ. Sc., xli., 345 ;
T. & H. Plioc. Foss. S. C., p. 133, pl. 28, f. 2.

Tritia multirugata, Conr. Proc. Ac. N. S. Phil., 1862, p. 562.

Miocene.—N. and S. Carolina.

3. PTYCHOSALPINX PORCINA.

Buccinum porcinum, Say. Journ. Ac. N. S. Phil., iv., p. 126 ;
T. & H. Plioc. Foss. S. C., p. 133, pl. 28, f. 1.

Tritia porcina, Conr. Proc. Ac. N. S. Phil., 1862, p. 562.

Miocene.—Maryland ; N. and S. Carolina.

4. PTYCHOSALPINX ESCHERI.

Buccinum Escheri, Mayer. Journ. Conch., vii., 1858, p. 82,
pl. iv., f. 6.

Other species confounded with *Buccinum*, &c., appear to belong to the genus, but cannot be referred to it with the certainty desirable, and the preceding are given as typical examples.

* The *siphonal fasciole* is the zone generally differentiated by sculpture which at its end forms the internal boundary of the siphonal notch or canal. As its modifications and relations are often of considerable importance and serve to distinguish genera and higher groups, it is deserving of a distinctive name, and that here proposed is sufficiently suggestive.

MONOGRAPH OF THE TERRESTRIAL MOLLUSCA OF THE
UNITED STATES.

BY GEORGE W. TRYON, JR.

[Continued from page 68.]

*** Aperture expanded, ear-shaped, its margin continuous; upper lip tooth hook-shaped.*

20. Dædalochila auriformis, Bland.

Plate 11, figures 1, 2, 3.

Depressed and ribbed-striate above, periphery subangular, convex and smooth beneath; whorls $5\frac{1}{2}$ —6, suture moderate, the last one slightly deflected and expanded at the aperture into an ear-shaped lip, behind which it is constricted; the base shows nearly two whorls, and a minute perforation, and a deep groove revolving on the inner side of the whorls; aperture ear-shaped, the peristome continuous and expanded, parietal tooth linguiform, two lip teeth, the upper one of which is a submarginal perpendicular lamella, and the basal one an oblique fold. White or brownish horn color.

Diam. 10, alt. 5.5 mill.

Alabama; Texas.

Differs from *D. avara* in having an umbilical groove.

21. Dædalochila avara, Say.

Plate 11, figures 4, 5, 6.

Spire depressed, periphery slightly angular; whorls 5, slightly convex above, with moderate suture, coarsely ribbed, hirsute, convex below, and ribbed only for a short distance be-

hind the lip, the balance of the base nearly smooth; base without groove, showing a little more than one whorl, and with a minute perforation; aperture with reflected lip, the extremities of which are joined by a callus, forming a large V-shaped tooth; right margin with two teeth, one of them basal and oblique, the other submarginal and lamellar.

Diam. 7, height 3 mill.

Florida.

22. *Dædalochila espiloca*, Ravenel.

Plate 11, figures 7, 8, 9.

Spire slightly elevated and a little convex, periphery subangular, well rounded below; whorls 5, thin, ribbed-striate above, finely striate below, suture moderate; the last whorl a little deflected and contracted behind the aperture; base showing $1\frac{1}{2}$ whorls, the umbilical region bounded by an angle; margin of aperture continuous, the parietal tooth linguiform, the upper lip tooth hook-shaped at its lower termination, the basal tooth oblique. Horn color, shortly hirsute.

Diam. 8, alt. 3.5 mill.

Sullivan's Island, South Carolina.

23. *Dædalochila Postelliana*, Bland.

Plate 11, figures 10, 11, 12.

Spire slightly elevated, conical; whorls 5, ribbed-striate above, finely striate below, periphery subangular; aperture ear-shaped, much contracted, the margins joined by a large linguiform parietal tooth entering the aperture, right margin with a deep-seated lamella terminating below in a hook, basal margin with a prominent oblique lamella extending to the edge of the lip. Brownish horn-color, thin, pellucid, aperture white.

Diam. 9.5, alt. 5 mill.

Georgia.

24. *Dædalochila auriculata*, Say.

Plate 11, figures 13, 14.

Spire low, conical; whorls 5, ribbed-striate above and below, the periphery slightly angulate; last whorl suddenly deflected to the aperture, and very strongly scrobiculate behind the middle of the right margin, and also at the base; aperture oblique, auriform, the parietal tooth large, irregular, projecting inwards and upwards, the right margin with a perpendicular lamellar tooth, and the base twisted into a large oblique tooth; base showing $1\frac{1}{2}$ whorls, the umbilical region bounded by a carina.

Diam. 13, height 7.5 mill.

St. Augustine, Florida.

Larger than the other species, and distinguished by the ribs on the base.

25. *Dædalochila uvulifera*, Shuttleworth.

Plate 11, figures 15, 16.

Spire depressed conical; whorls 5, with close ribs extending entirely across the base; periphery subangulate, lower surface convex; last whorl deflected at the aperture and scrobiculate; aperture oblique, much contracted by teeth, with the lip very much expanded, parietal tooth quadrately linguiform, extending into the aperture, the upper lip tooth situated far within the aperture, the basal lip tooth an oblique plication; umbilical region subcarinate. Horn color.

Diam. 12, alt. 7 mill.

Florida; Corpus Christi, Texas.

Smaller, with differently formed aperture from *D. auriculata*.

POLYGYRA, Say.

This is a tropical genus, containing many flat, wheel-shaped species which inhabit the shores of the Gulf of Mexico, the West Indies and Mexico. The southern limit of the group extends to the vast regions of the empire of Brazil, whence come the curious *P. heligmoidea* and *P. helicycloidea*. Unlike *Dædalochila*, the

aperture is simple and small, the lip reflected but not expanded, and not dentate, while the parietal tooth is small. The aspect of the shell is singularly like that of *Planorbis*, and reminds one strongly of several of the species of that fresh water genus inhabiting Europe. A thin, thread-like lamina occasionally revolves upon the inner wall of the aperture, and is visible through the whorl; it has been detected in most of the species, and probably is at times developed in all of them, though many specimens are without it.

1. *Polygyra anilis*, Gabb.

Plate 11, figures 17, 18.

Spire nearly flat, whorls $4\frac{1}{2}$, the last descending to the aperture, and a little constricted, suture well impressed, surface microscopically striate above and below; base showing about $1\frac{1}{2}$ whorls, with a minute central perforation. White.

Diam. 13, height 6 mill.

Guaymas, Mexico.

This is scarcely a typical *Polygyra*, as it does not exhibit so many whorls on the base as the other species. The aperture, however, is that of a *Polygyra*.

2. *Polygyra cereolus*, Mühlfelt.

Plate 11, figures 19, 20, 21.

Shell lenticular, the spire very nearly flat, under surface flat or slightly concave, periphery subangulate; whorls 7, flattened and closely ribbed above; base smoother, showing 5 whorls, with a narrow umbilicus; aperture small, subtriangular, the margins connected by a slight callus, developing in the middle into a small triangular tooth. Light horn color.

Diam. 14, alt. 3.5 mill., var. *major*.

“ 9, “ 2.5 “ “ *minor*.

East Florida.

Differs from *P. septemvolva* principally by its umbilicus being much narrower. (Compare fig. 19 with fig. 22.)

3. *Polygyra septemvolva*, Say.

Plate 11, figure 22.

Shell discoidal, with seven whorls, which are closely ribbed-striate above, the periphery subangular; smooth below, and exhibiting about four whorls besides those forming the walls of the rather large umbilicus. Horn color.

Diam. 14, height 3.5 mill.

Florida.

4. *Polygyra Carpenteriana*, Bland.

Plate 11, figures 23, 24.

Subdiscoidal, spire slightly elevated; whorls $5\frac{1}{2}$ to $6\frac{1}{2}$, thin, shining, closely obliquely ribbed above, smooth beneath the angular periphery; base showing $2\frac{1}{2}$ whorls, with a minute perforation. Light horn color or rufous, with frequently opaque irregular bands crossing the whorls.

Diam. 8—10, alt. 3—4 mill.

East Florida.

5. *Polygyra volvoxis*, Parreyss.

Plate 11, figure 25.

Spire a little elevated; whorls 7, flattened above, convex beneath, the periphery carinate; upper surface and base near the aperture closely ribbed, the balance of the base smooth; over two whorls visible below, besides a narrow umbilicus. Horn color, with frequently white blotches or bands running across the whorls.

Diam. 9, alt. 4 mill.

East Georgia and Florida.

This is perhaps a young state of *P. septemvolva*, Say.

6. *Polygyra Febigerii*, Bland.

Plate 10, figures 30, 33.

Depressed, spire scarcely raised; whorls $5\frac{1}{2}$ —6, ribbed-striate above, finely striate below, periphery angulate; aperture subtriangular, with a small parietal tooth; base exhibiting about $1\frac{1}{2}$ whorls, with a central perforation. Pale reddish horn color.

Diam. 8.5, alt. 3.5 mill.

New Orleans.

Differs from the other species of the genus by having no excavation in the whorl behind the lip.

7. *Polygyra polygyrella*, Bland and Cooper.

Plate 11, figure 26.

Discoidal, shining, translucent; spire slightly elevated; whorls 7—8, ribbed above, smooth below; aperture armed with two rows of three teeth each, visible through the whorl, margins joined by a V-shaped tooth; base widely umbilicate, exhibiting about 3 whorls. Yellowish horn colored.

Diam. 11.5, alt. 5 mill.

Cœur d'Alêne Mountains.

It is very doubtful whether this species is properly placed in *Polygyra*; it differs in the teeth arranged in rows within the aperture.

Descriptions of additional species of Helices, and notes on some of those already described.

***Aglaja sequoicola*, Cooper-**

Plate 11, figure 27.

"Shell rounded, umbilicate, spire depressed, last whorl sometimes subangulate, whorls 6 to $6\frac{1}{2}$, peristome oblique, little deflected above; labium thin, reflexed, thickest below; acute. Color dark brown or olivaceous, with a broad black band between two yellow ones, half hidden on the spire, lips white; within a fine purple with two white bands. Epidermis shining, polished below, the lines of growth faintly visible, sometimes very lightly malleated, and with spiral ridges; above with crowded scars bearing very short bristles in the young shell which fall off in the adult.

Animal slate colored, body cylindrical, rugose, tentacles moderate; foot elongated, behind wedge-shaped.

Shell—large diameter 0.96 to 1.20; smaller diameter 0.76 to 0.96; height 0.42 to 0.54 hundredths of an inch.

Santa Cruz, Cal., among decayed trees in the dampest places.

This beautiful species is quite rare, only nine adult and twelve young specimens having been found after long searching. It will probably occur more commonly in some part of the red-wood forest; which I have been unable to explore. It approaches nearest to *H. Dupetithouarsi* and *H. fidelis*, being between them in form and size as well as color, but the pilosity at once distinguishes it. Its distinct bands and rounded whorls separate it from *H. infumata* and *Hillebrandii*, the latter when perfect having also much longer hairs. The animal is lighter colored than those of *H. arrosa*, *Nickliniana*, *redimita*, *ramentosa*, *tudiculata* (which are all very similar), but much darker than that of *Dupetithouarsi*, and I believe also of *fidelis* and *infumata*. The form of the shell is a link connecting these with *Mormonum*."—*Proceedings California Acad. Nat. Sci.*, April, 1866.

Through the kindness of Dr. Wesley Newcomb, of Oakland, California, I am enabled to give figures from his types of several species, which I was not able to illustrate at the time they were described.

***Aglaja Ayresiana*, Newcomb, sp. 7. Plate 11, fig. 28.**

This species comes from the Island of Sta. Cruz; the locality originally given by Newcomb is incorrect. It is thus a sub-tropical, and not a boreal species.

***Aglaja Bridgesii*, Newcomb, sp. 11. Plate 11, fig. 29.**

***Aglaja Rowellii*, Newcomb, sp. 18. Pl. 11, fig. 30.**

***Aglaja Gabbii*, Newcomb, sp. 17. Plate 11, fig. 31.**

I re-figure this species from a specimen received from Dr. Newcomb, the original figure, pl. 6, fig. 19, being unsatisfactory and more like the following species, to which *Gabbii* is closely allied.

Aglaja facta, Newcomb.

Plate 11, figure 32.

"Shell with perforation nearly covered, depressed orbicular, solid, compact, smooth, whitish, zoned with a brownish-red band; whorls 5 to $5\frac{1}{2}$, somewhat convex, the last descending; suture slightly impressed; aperture oval; lip thick, reflected, yellowish.

Diam. 10, height 5 mill.

Islands of Sta. Barbara and San Nicolas, off the coast of California."—*Proc. California Acad. Nat. Sci.*, iii., 1864.

Polymita levis, Pfeiffer.

Plate 5, figure 21.

Plate 6, fig. 6, erroneously referred to this species, is a variety of *Arionta Veitchii*, Newcomb, from Cerros Island (not Bay of Monterey, Cal., as stated in description). The type of *Veitchii* is figured in pl. 5, fig. 19.

Conulus chersinella, Dall.

Plate 11, figures 33, 34, 35.

"Shell small, somewhat elevated, smooth, except that the lines of growth are occasionally indented; umbilicus minutely perforate; aperture semi-lunar and slightly oblique; whorls rotund, $4\frac{1}{2}$ to 5 in number; sutures impressed, not deep; lip not thickened or reflected. Color yellowish, translucent.

Diam. .14 in., height .09 in.

Big Trees, Calaveras Co., California.

This small species has relations with *H. chersina*, Say, and *H. indentata*, Say. It resembles the former in its small size and many whorls, but differs in color and depressed spire, though sometimes almost as acute. It is related to the latter in its color and indented lines of growth, but differs in its greater number of whorls and much smaller size, and in the proportional size of the last whorl."—*American Jour. of Conchology*, ii. p. 328, 1866.

Hyalina Hornii, Gabb.

Plate 11, figures 36, 37, 38.

"Shell small, openly umbilicate, depressed; covered with an opaque brown epidermis, which, under the glass, shows minute oblique striations, and a few small, scattered hairs; whorls $4\frac{1}{2}$, the first $3\frac{1}{2}$, forming a very low, nearly flat spire, the last descending much more rapidly; suture strongly marked, especially between the last and penultimate whorl; umbilicus occupying about a third of the inferior surface, indistinctly perspective; aperture oblique, subcircular; lip simple, inner margins approximating.

Height .09, diam. .16 inch.

Fort Grant, junction of Arivapa and San Pedro Rivers, Arizona."—*Am. Jour. of Conchology*, ii. p. 330, 1866.

Gastrodonta significans, Bland.

Plate 11, figures 39, 40, 41.

"Shell umbilicate, depressed, discoidal, thin, with fine irregular striæ, which are almost obsolete at the base, shining, pale horn-colored, spire little elevated; suture slightly impressed; whorls 6, subplanulate, the last roundly inflated, rather flat at the base, excavated around the umbilicus, which is pervious, and equal almost to one-fifth the diameter of the shell; aperture oblique, depressed, lunate; peristome simple, acute.

Diam. 4.5, alt. 2 mill.

Fort Gibson, Indian Territory.

It is especially allied to *G. multidentata*, Binney, from which it differs in being of larger size, with wider umbilicus, and in the absence in the last whorl of the series of numerous small teeth which characterize Binney's species.

In a young specimen of *G. significans*, having four whorls only, there are, however, three small teeth, one by itself, and at some distance from it two others, situated as the teeth are in *G. multidentata*. Whether these teeth are or not constant in the ante-penultimate whorl of *G. significans*. I am unable to determine."—*Am. Jour. Conch.*, ii. p. 372, 1866.

Spurious Species.

HELIX HARPA, Say, belongs to the family Pupadæ.

HELIX IRRORATA, Say, = *H. lactea*, Müll., a Spanish species.

HELIX TRUMBULLI, Linsley, = *Skenea serpuloides*.

Family ORTHALICIDÆ.

Shell oval or elongated, with elevated spire, much longer than its width; aperture oval, entire below, the columella sometimes truncate at its termination; lip either sharp and simple, expanded or reflected, with or without teeth (none in North American genera), umbilicus generally covered.

Sub-families.

ACHATININÆ. Shell oblong; aperture oval, angulated above, rounded below, the lip sharp and not reflected, columella truncate below. Colors generally bright and variegated. Size large.

ORTHALICINÆ. Shell oblong, thin, imperforate; aperture oval, large, angulate above, rounded below, columella arcuate, thickened in the middle. Gaily painted in longitudinal reddish flames. Size moderate.

BULIMULINÆ. Shell oblong-turrit, moderately thick; aperture oval, small, outer lip generally expanded or reflected, inner lip reflected, axis perforate, rimate, or sometimes covered. Color white or brownish, sometimes variegated. Size small.

ACHATININÆ.

LIGUUS, Montfort.

Shell elongate-conical, spire elevated, apex acuminate, imperforate, solid, whorls 7—8, well rounded, the last about one-third of the total length; aperture semi-oval, margin thin, straight, columella obliquely subtruncate below. Gaily fasciate.

This is the only genus of the subfamily inhabiting the Western Continent, and the few species may be regarded as insular in origin, inhabiting principally Cuba, whence the two following have extended to the southern part of the adjacent coast of Florida.

1. *Liguus fasciata*, Müller.

Plate 12, figures 1, 2, 3, 5, 6.

Shell elongate-conical, striate by growth lines, solid, smooth, shining; spire elevated, apex acute, suture not deeply impressed; whorls 8, slightly convex, the last large, equalling from one-half to three-fifths of the total length of the shell; aperture semi-oval, generally pure white within, columella arcuate, and truncate at the base, with a rose-colored callus. Color white, variously ornamented with broad or narrow bands of yellow, green or purple, the apex, and sometimes the whole shell also, flamed with brown longitudinal zig-zags.

Length 55, diam. 25 mill.

Florida. (From Cuba.)

It is impossible to designate by description the extreme variation of coloring in this beautiful species; the variety with numerous green bands, and that with broad, yellow bands, (the latter the *Achatina solida* of Say,) are the most numerous in Florida.

2. *Liguus picta*, Reeve.

Plate 12, figure 4.

Shell ovate-conical, striate by growth lines, solid, smooth, shining; spire elevated conical, suture moderately impressed; whorls 7, the last large; aperture semi-oval, small, columella nearly perpendicular, truncate at base. Yellowish white, variegated externally by a double band of irregular brown spots upon the periphery, and above and below each sutural line, and also surrounding the columella, apex of spire and columella pink, whorls of spire with brown flames.

Length 44, diam. 24 mill.

Florida. (From Cuba.)

Differs from the foregoing principally in the pattern of coloring.

ORTHALICINÆ.**ORTHALICUS, Beck.**

Shell ovate, imperforate, thin, striate, fasciate; whorls 6—8, the last inflated; aperture large, oval, lip thin and straight, columella sub-receding, obsoletely folded, rather thin.

This genus, together with the others comprising the subfamily, is of South American origin. In the northern part of that continent, the species are numerous, but one only inhabits the West Indies and the circumjacent North American coast. The *Orthalicus zebra*, distinguished by all American authors from the *undatus*, is scarcely even a variety of it, while the true *O. zebra* of Müller, a very different shell, inhabits the western parts of South America.

1. *Orthalicus undatus*, Ferussac.

Plate 13, figures 1, 2, 3.

Shell subconical, striated by growth lines, thick; spire elevated, suture moderate, slightly crenated; whorls 6, convex, the last about two-thirds of the total length of the shell; aperture large, ovate. White, with longitudinal undulated or zig-zag chocolate-colored flames, intersected by three narrow revolving lines of the same color; inner surface marked the same as the external.

Length 45, diam. 27 mill.

Southern Florida.

BULIMULINÆ.

All the genera of this subfamily are of South American origin, and only a few species of them extend into the subjacent parts of North America.

1. *DRYMÆUS*, Albers. Elongate-conical, perforate or rimate, thin, diaphanous, variegated; aperture large, oblong ovate, columella more or less twisted, peristome thin, expanded, columellar margin reflexed.
2. *LIOSTRACUS*, Albers. Oblong-conical, perforate, thin, smooth, fasciate; aperture obliquely semi-oval, lip thin, more or less expanded, the columellar margin dilated, reflexed.

3. MESEMBRINUS, Albers. Ovate-conical, rimate, rather thin, striate, white, generally variegated with brown; aperture oblong-oval, small, lip thin, and not reflected, columellar margin more or less dilated, reflected and appressed, columella slightly twisted.
4. THAUMASTUS, Albers. Shell oblong-conical, imperforate or rimate, nearly smooth, white, sometimes variegated with brown flames; aperture oblong-oval, lip obtuse, straight or slightly expanded, columellar margin reflexed, more or less appressed, columella distinctly twisted.
5. MORMUS, Albers. Shell oblong-conical, striate or subcostate, thin, whitish or variegated with brown, upper whorls flattened, the body whorl very convex, inflated; aperture subovate, the lips simple, sharp, columellar margin dilated and reflected.
6. SCUTALUS, Albers. Ovate-conical, perforate or umbilicate, roughly striate, whitish or brownishwhite, seldom variegated, last whorl ventricose, compressed at the base; aperture ovate-oblong, peristome more or less expanded, slightly thickened within.
7. PERONEUS, Albers. Oblong-turritid, perforate, white, sometimes variegated with brownish, spire elevated, the last whorl one-third of the total length; aperture oblong-oval, lip expanded, not thickened, columellar margin dilated; columella receding or obsoletely arcuate.

DRYMÆUS, Albers.

1. *Drymæus serperastrus*, Say.

Plate 13, figure 4.

Shell ovate-fusiform, umbilicate, thin, translucent; spire acuminate, suture moderately impressed; whorls about 7, a little convex; aperture elongate-lunate, the lip expanded a little, and reflected upon its columellar margin; umbilicus moderate. Yellowish white, with about six interrupted bluish black bands on the body whorl, which sometimes coalesce; the internal coloring is the same, except near the lip margin, where the bands disappear.

Length 37, diam. 17.5 mill.

Texas and Mexico.

2. *Drymæus Mexicanus*, Lamarck.

Plate 13, figure 5.

Ovately acuminate, narrowly umbilicate, thin, pellucid, with thin incremental striæ. White with two brown zones on the last whorl, and maculations of the same color on the others.

Length 28 mill.

Cinaloa, North-western Mexico.

LIOSTRACUS, Albers.

1. *Liostracus Ziegleri*, Pfeiffer.

Plate 13, figure 6.

Shell ovate-conical, narrowly perforate, slightly striate, decussated by nearly obsolete spiral lines; spire conical, acute; whorls 6, slightly convex, the last subangulate in the middle; aperture oval, the lip simple, slightly reflexed on the columellar margin, columella scarcely receding. White, sometimes with chestnut bands, and interruptedly maculate upon the spire.

Length 21, diam. 10 mill.

Cinaloa, North-western Mexico.

2. *Liostracus Floridanus*, Pfeiffer.

Plate 13, figure 7.

Ovately turritid, perforate, rather smooth, hyaline with white opaque lines and maculations; spire elongate, acute; whorls $6\frac{1}{2}$, slightly convex, the last scarcely one-half of the total length of the shell, subangulate below the middle, and attenuated at the base; aperture oval, oblique, columella receding, a little twisted, columellar margin of the lip expanded and reflected. Interruptedly fasciate with brown.

Length 16, diam. 8 mill.

Florida.

3. *Liostracus Dormani*, W. G. Binney.

Plate 13, figure 8.

Ovately turritid, perforate, smooth; spire elongate, acute, suture impressed; whorls 6, slightly convex, with minute revolving lines, last whorl convex, with a very obtuse carina on the periphery; aperture semi-oval, columella perpendicular. Shining white, with several revolving rows of perpendicular, reddish-brown patches.

Length 29, diam. 12 mill.

St. Augustine, Florida.

MESEMBRINUS, Albers.

1. *Mesembrinus multilineatus*, Say.

Plate 13, figures 11, 12.

Ovate-conic, smooth; spire elevated, suture distinct, but not deep; whorls 7, slightly convex, the last three-fifths of the total length; aperture small, oval, columella perpendicular, perforation partly covered. Yellowish-white, with chestnut longitudinal lines, a dark infra-sutural line, and a black apex, umbilical area and lip.

Length 17, diam. 8 mill.

East Florida.

The markings are not unlike those of *M. virgulatus*, Fer., of West Indies.

2. *Mesembrinus Humboldti*, Reeve.

Plate 13, figure 13.

Ovately turritid, thin, smooth, narrowly umbilicated; spire elongate, acute; whorls 7, somewhat convex, the last three-fifths of the total length; aperture oblique, oval, lip sharp, not reflected, columellar margin dilated and appressed. White or yellowish, with narrow, interrupted brown bands, sometimes not banded.

Length 31, diam. 15 mill.

Cinaloa, North-western Mexico.

This species is described from Peru, and the identity of the Mexican specimens may be regarded as questionable.

3. *Mesembrinus inscendens*, Binney.

Plate 14, figure 21.

Shell rimate, thin, narrowly turritid, suture well marked: whorls 7, with minute revolving lines, the apex ribbed; aperture narrowly ovate, oblique, lip simple, columellar margin reflected. Reddish-brown.

Length 36, diam. 10 mill.

Lower California.

THAUMASTUS, Albers.

1. *Thaumastus pallidior*, Sowerby.

Plate 13, figure 9.

Elongate-ovate, rimate, striate by growth lines; spire elevated, acuminate, whorls 6, convex, the last two-thirds the total length; aperture subovate, lip reflexed, its extremities approaching and connected by a slight callus. White, yellowish white within.

Length 37, diam. 23 mill.

San Juan, Gulf of California; Cape St. Lucas, Lower California.

2. *Thaumastus Californicus*, Reeve.

Plate 13, figure 14.

Ovately turritid, thin, scarcely umbilicated; spire elevated-conical; whorls 6, smooth; aperture oval, lip sharp, expanded, columellar margin reflexed. White, with transverse bluish-black zones.

Length 19, diam. 10 mill.

California (Reeve).

Probably from Lower California. Very closely allied to *serpistrus*, Say.

3. *Thaumastus excelsus*, Gould.

Plate 13, figure 10.

Elongate-ovate, acuminate, somewhat solid, smooth; spire elevated, acute; whorls 7, the last two-thirds the total length; aperture small sub-ovate, lip reflexed, columellar margin much expanded, lip extremities joined by a slight callus; axis rimate. Fulvous with white strigations, lip white.

Length 44, diam. 19 mill.

Lower California.

4. *Thaumastus patriarcha*, W. G. Binney.

Plate 13, figure 15.

Shell ovate, perforate, solid, rugosely striate; whorls 6, convex, the last ventricose and two-thirds of the total length; aperture ovate, lip thickened within, and its extremities joined by a heavy white callus, columellar margin slightly reflected over the umbilicus. White.

Length 35, diam. 19 mill.

Texas and Mexico.

Larger and more rugose than the allied species.

5. *Thaumastus alternatus*, Say.

Plate 13, figure 16.

Plate 14, figures 10, 12.

Ovate-conic, rather thick, umbilicated; suture slightly impressed; whorls 6, lip simple, expanded, thickened within, columellar margin reflected. White, yellowish or grey, with brown oblique longitudinal irregular or jagged bands, sometimes confluent.

Length 30, diam. 17 mill.

Texas and Mexico.

Fig. 16 represents the typical form, and fig. 12 a not quite adult, highly colored form; fig. 10 is a small and more numerous variety, if it be not indeed specifically distinct. It is the shell described by Menke as *Bulinus lactarius*.

6. *Thaumastus Schiedeanus*, Pfeiffer.

Plate 14, figures 1, 2, 4, 5.

Ovate-conic, thick, irregularly longitudinally striate, narrowly umbilicate; whorls $6\frac{1}{2}$, slightly convex, the last large; aperture oblong-oval, lip simple, a little expanded, thickened within, columellar margin reflected, columella more or less plicate. White, brownish inside.

* Length 31, diam. 17 mill.

Texas and Mexico.

This species appears to vary considerably in form, some specimens being longer and less inflated than the type, and being obtusely angulated on the periphery. A young shell of this character is copied from W. G. Binney (fig. 2), who proposes, should it prove to be distinct, to call it *Mooreanus*. I add an older specimen, of the same form (fig. 4), but without the coloration of Mr. Binney's shell; it is from Brownsville, Texas. Fig. 5 represents a not unusual variety with distinct columellar tooth, which Pfeiffer supposed distinct, and proposed to call *Bulimus Binneyanus*. The examination of many shells showing the transition from a smooth to a toothed columella, convinces me that they are all of one species.

7. *Thaumastus Mariæ*, Albers.

Plate 14, figure 3.

Oblong conical, solid, rather smooth, narrowly umbilicate; spire conical, acute; whorls $6\frac{1}{2}$, slightly convex, attenuate at the base; aperture acuminate oblong, oblique, lip sharp, columellar margin dilated and reflected, columella with a small tooth. White, with obsolete brown spots and dashes, brown within.

Length 33, diam. 14 mill.

Texas.

MORMUS, Albers.

1. *Mormus sufflatus*, Gould.

Plate 14, figure 6.

Ovate, slightly striate, thin, slightly perforate; spire short; whorls $5\frac{1}{2}$, the last elliptical, and equalling three-fourths of the total length; aperture lunate, lip simple, columella reflexed. White.

Length 33, diam. 17 mill.

Lower California.

2. *Mormus pilula*, W. G. Binney.

Plate 14, figure 7.

Shell globular, thin, inflated, umbilicated; spire short-conical, suture well impressed; aperture rounded, lip thin, columellar margin broadly reflected. White, with two brown revolving bands.

Long. 12, lat. 9 mill.

Lower California.

SCUTALUS, Albers.**1. *Scutalus proteus*, Broderip.**

Plate 14, figure 8.

This is a Peruvian species, of which a number of young specimens have been collected in Lower California. It may not be more than an adventitious inhabitant of that peninsula.

2. *Scutalus dealbatus*, Say.

Plate 14, figure 9.

Shell ovate-conical, thin, ventricose; whorls 7, striate, with growth lines which are more apparent on the spire, the last whorl subglobose; aperture ovate, lip thin, the columellar margin reflected, umbilicus narrow. White, with interrupted oblique longitudinal grey or yellow streaks.

Length 18, diam. 11 mill.

North Carolina, Alabama, Texas, Missouri, Arkansas.

A very abundant species, which will probably be found to inhabit all the far southern States.

3. *Scutalus Xantusi*, W. G. Binney.

Plate 14, figure 11.

Shell ovate-oblong, longitudinally striate, with minute revolving lines; spire elevated, suture impressed; whorls $5\frac{1}{2}$, slightly convex; aperture ovate, lip simple, columella arched, parietal wall covered by a slight callus. White (bleached?).

Length 21, diam. 8 mill.

Lower California.

PERONÆUS, Albers.

1. *Peronæus artemesia*, W. G. Binney.

Plate 14, figure 22.

Shell subcylindrical, rimate; whorls 8, gradually increasing in size, flattened, suture well impressed; surface smooth, except first whorl and a half of spire, which are ribbed; aperture small, obliquely oval, its margins approaching and connected by a heavy callous deposit. White, almost transparent.

Length 23, diam. 6 mill.

Lower California.

*Addenda.**Bulimus (Leptomerus) Marielinus*, Poey.

Plate 14, figure 23.

Ovate-conical, thin, imperforate; whorls 5, slightly convex, transparent, with several sub-interrupted brown bands on the lower portion of the body whorl; aperture oval, columella perpendicular, lip thin, not reflected.

Long. 8 mill.

A Cuban species, recently found in South Florida.

Spurious Species.

ACHATINA (COLUMNA) CALIFORNICA, Pfeiffer, quoted from Monterey, California, is a South American species.

BULIMUS DECOLLATUS, Linn.,

BULIMUS ACICULA, Müller,

BULIMUS SUBULA, Pfeiffer,

BULIMUS LUBRICUS, Müller,

BULIMUS GRACILLIMUS, Pfeiffer,

BULIMUS GOSSEI, Pfeiffer,

BULIMUS KIENERI, Pfeiffer,

BULIMUS HARPA, Say,

BULIMUS MARGINATUS, Say,

} Are all to be referred to
the family Pupadæ.

HELICIDÆ.

SYNONYMY AND REFERENCE TO
PLATE 11.

DÆDALOCHILA.

- Figs. 1, 2, 3. *D. AURIFORMIS*, Bland. Ann. N. Y. Lyc., vii., p. 37, Dec., 1858.
- H. auriculata*, Binney. Terr. Moll., ii., (part,) t. 40, f. 1, (right hand) 2, 1851.
- H. avara*, Reeve. Conch. Icon., t. 121, No. 720, 1852.
- H. auriculata*, Reeve. Conch. Icon., t. 119, No. 700, 1852. No. 20.
- “ 4, 5, 6. *D. AVARA*, Say. Nicholson's Encycl., 1st Am. Edit., 1816.
Journal Acad. Nat. Sci, i., p. 277, 1818.
W. G. Binney, l. c. iv., p. 74, 1859.
Bland, Ann. N. Y. Lyc., vii., p. 30, Dec., 1858. No. 21.
- “ 7, 8, 9. *D. ESPILOCA*, Ravenel. Bland. Ann. N. Y. Lyc., vii., t. 4, f. 12, Apr., 1860. No. 22.
- “ 10, 11, 12. *D. POSTELLIANA*, Bland. Ann. N. Y. Lyc., vii., p. 35, Dec., 1858. No. 23.
- “ 13, 14. *D. AURICULATA*, Say. Nicholson's Encycl., Edit. 1, 1816.
Journal Acad. Nat. Sciences, i., p. 277, 1818.
Binney, Terr. Moll., ii., p. 186, (part,) t. 40, Fig. 1, (left hand,) 1851.
Bland, Ann. N. Y. Lyc., vii., p. 26, Dec., 1858.
W. G. Binney, l. c. iv., p. 73, 1859. No. 24.
- “ 15, 16. *D. UVULIFERA*, Shuttleworth. Bern. Mittheil., p. 199, Aug., 1852.
Chemnitz, 2d Edit., ii., p. 426, t. 148, f. 19, 20, 1853.

Binney, l. c. iii., p. 20, 1857.

W. G. Binney, Terr. Moll., iv., p. 75, 1859.

Bland, Ann. N. Y. Lyc., vii., p. 34, Dec., 1858.

H. florulifera, Reeve. Conch. Icon., No. 699, Aug., 1852. No. 25.

POLYGYRA.

Figs. 17, 18. P. ANILIS, Gabb. American Journal of Conchology, i., p. 209, t. 19, f. 1—4, July, 1865. No. 1.

“ 19, 20, 21. P. CEREOLUS, Mühlfelt. Berlin Magazine, viii., p. 41, t. 2, f. 18, 1816.

Bland, Ann. N. Y. Lyc., vii., May, 1860.

(Part) W. G. Binney, l. c. iv., p. 90, t. 77, f. 23, 1859.

H. septemvolva, (Part) Binney, Terr. Moll., ii., p. 196, 1851. No. 2.

“ 22. P. SEPTEMVOLVA, Say. Nicholson's Encyc., 1st Edit., 1816.

(Part) Binney, l. c. ii., p. 196, t. 38, t. 39, f. 1, 1851.

Bland, Ann. N. Y. Lyc., vii., May, 1860.

H. planorbula, Lamarck. Ann. S. Vert., vi., p. 89.

H. cereolus, Mühlf., (Part) W. G. Binney, l. c. iv., p. 90, 1859. No. 3.

“ 23. 24. P. CARPENTERIANA, Bland. Ann. N. Y. Lyc., vii., May, 1860.

H. microdonta, Desh. W. G. Binney, l. c. iv., p. 91, t. 78, f. 23, 1859.

H. plana, Dunker. Phil. Icon., i., p. 51, t. 3, f. 11, 1845. No. 4.

“ 25. P. VOLVOXIS, Parreyss. Pfeiffer Symbolæ, iii., p. 80, 1846.

W. G. Binney, Terr. Moll., iv., p. 92, t. 78, f. 17, 1859.

H. septemvolva var., Bland. Ann. N. Y. Lyc., vii., 1860. No. 5.

“ 26. P. POLYGYRELLA, Bland and Cooper. Ann. N. Y. Lyc., vii., t. 4, f. 13—15, June, 1861. No. 7.

AGLAJA.

(See also Plates 5 and 6.)

Fig. 27. A. SEQUOICOLA, Cooper. Proc. California Acad.
Nat. Sciences, Apr., 1866.

“ 28. A. AYRESIANA, Newcomb. (See reference to
pl. 5.)

“ 29. A. BRIDGESII, Newcomb. (See reference to
pl. 5.)

“ 30. A. ROWELLII, Newcomb. (See reference to
pl. 6.)

“ 31. A. GABBII, Newcomb. (See reference to pl. 6.)

“ 32. A. FACTA, Newcomb. Proc. California Acad.
Nat. Sciences, iii., 1864.

CONULUS.

“ 33, 34, 35. C. CHERSINELLA, Dall. Am. Jour.
Conch., ii., p. 328, t. 21, f. 4, Oct., 1866.

HYALINA.

“ 36, 37, 38. H. HORNII, Gabb. Am. Jour. Conch.,
ii., p. 330, t. 21, f. 5, Oct., 1866.

GASTRODONTA.

“ 39, 40, 41. G. SIGNIFICANS, Bland. Am. Jour.
Conch., ii., p. 372, t. 21, f. 9, Oct., 1866.

ORTHALICIDÆ.

SYNONYMY AND REFERENCE TO
PLATE 12.

LIGUUS.

Figs. 1, 2, 3, 5, 6. L. FASCIATA, Müller. Hist. Verm.,
ii., p. 145, 1774.
Binney, l. c. ii., p. 266, t. 55, (not 56,) 57,
1851.

W. G. Binney, l. c. iv., p. 138, 1859.

Bulinus verrillum, Brug.

Achatina solida, Say. Jour. Acad. Nat. Sci.,
v., p. 122, 1825.

A. crenata, Swainson.

A. pallida, Swainson.

Bulla virginea, B. Linn. Syst. Nat., Edit. 12,
p. 1186.

A. lineata, Valenciennes. Recueil d'Observ.,
p. 248, t. 55, f. 2, 1833.

A. murrea, Reeve. Conch. Icon., t. 7, f. 22,
a, b.

A. anais, Lesson.

A. lutea, Weigmann.

Bulinus zebra, Orb. Moll. Cuba.

No. 1.

Fig. 4. *L. PICTA*, Reeve. Conch. Icon., t. 10, f. 34.

Bulinus fasciatus. (Part) Binney, l. c. ii., p.
266, t. 56, 1851.

W. G. Binney, l. c. iv., p. 138, 1859.

No. 2.

ORTHALICIDÆ.

SYNONYMY AND REFERENCE TO

PLATE 13.

ORTHALICUS.

Figs. 1, 2, 3. *O. UNDATUS*, Ferussac. Hist. des Moll.,
p. 52, t. 115, f. 194, t. 114, f. 5, 6.

Shuttleworth, Notitiæ Malacol, p. 63, t. 3, f.
4, 5, 1856.

Bulinus zebra, (Not of Müller,) Binney, l. c.
ii., p. 271, t. 54, 1851.

W. G. Binney, l. c. iv., p. 125, t. 77, f. 13, t.
78, f. 12, 1859.

No. 1.

DRYMÆUS.

“ 4. *D. SERPERASTRUS*, Say. New Harmony Dis-
seminator, Dec. 28, 1831.

- Binney, l. c. ii., p. 274, t. 50, f. 2, 1851.
 W. G. Binney, l. c. iv., p. 126, 1859. No. 1.
- Fig. 5. D. MEXICANUS, Lamarek. Anim. S. Vert.,
 viii., p. 252, 1838.
 Reeve, Conch. Icon., t. 40, f. 244.
 Carpenter, Mazatlan Cat., p. 177, 1857. No. 2.

LIOSTRACUS.

- " 6. L. ZIEGLERI, Pfeiffer. Proc. Zool. Soc., p. 113,
 1846.
 Reeve, Conch. Icon., t. 58, f. 389.
 Carpenter, Mazatlan Cat., p. 177, 1857. No. 1.
- " 7. L. FLORIDANUS, Pfeiffer. Zool. Proc., p. 330,
 1856.
 W. G. Binney, l. c. iv., p. 134, t. 79, f. 3,
 1859. No. 2.
- " 8. L. DORMANI, W. G. Binney. Proc. Acad. Nat.
 Sci., p. 188, 1857.
 Terr. Moll., iv., p. 132, t. 80, f. 10, 1859. No. 3.

THAUMASTUS.

- " 9. T. PALLIDIOR, Sowerby. Proc. Zool. Soc., p.
 108, 1832.
 Reeve, Conch. Icon., t. 55, f. 365.
Bul. vegetus, Gould. Bost. Jour., vi., p. 375,
 t. 14, f. 2.
 Gould, Otia Conchologica, p. 184, 1862. No. 1.
- " 10. T. EXCELSUS, Gould. Bost. Jour., vi., p. 376,
 t. 14, f. 3, Oct., 1853.
 W. G. Binney, l. c. iv., p. 24, t. 79, f. 12,
 1859. No. 2.

MESEMBRINUS.

- " 11, 12. M. MULTILINEATUS, Say. Proc. Acad.
 Nat. Sci., v., p. 120, 1825.
 W. G. Binney, l. c. iv., p. 132, 1859.
Bul. virgulatus, (not of Fer.,) Binney, l. c. ii.,
 p. 278, t. 58, 1851. No. 1.
- " 13. M. HUMBOLDTI, Reeve. Conch. Icon., t. 58, f.
 391. No. 2.

THAUMASTUS.

(See also figs. 9, 10.)

- Fig. 14. T. CALIFORNICUS, Reeve. Conch. Icon., No. 378, Dec., 1848.
 W. G. Binney, l. c. iv., p. 24, t. 79, f. 15, 1859. No. 3.
- “ 15. T. PATRIARCHA, W. G. Binney. Proc. Acad. Nat. Sci., p. 116, 1858.
 W. G. Binney, Terr. Moll., iv., p. 130, t. 80, f. 13, 1859. No. 4.
- “ 16. T. ALTERNATUS, Say. New Harmony Disseminator, Dec. 28, 1831.
 W. G. Binney, l. c. iv., p. 126, t. 80, f. 1, 3, 1859.
Bul. dealbatus, Say, (Part) Binney, l. c. ii., p. 276, t. 51, f. 2, t. 51 a, (excl. other figures,) 1851.
Bul. lactarius, Menke. No. 5.

ORTHALICIDÆ.

 SYNONYMY AND REFERENCE TO
 PLATE 14.

THAUMASTUS.

(See also pl. 13.)

- Figs. 1, 2, 4, 5. T. SCHIEDEANUS, Pfeiffer. Symb. ad Hist. Hel., i., p. 43, 1841.
 W. G. Binney, l. c. iv., p. 129, t. 80, f. 8, 15, 1859.
- Bul. Binneyanus*, Pfr. W. G. Binney, l. c. iv., p. 128, 1859.
- Bul. dealbatus*, (Part) Binney, l. c. ii., p. 276, t. 51, b., (excl. other figures,) 1851. No. 6.

Fig 3. T. MARLÆ, Albers. Proc. Zool. Soc., p. 23,
1848.

Chemnitz, Conch. Cab., t. 48, f. 7, 8. No. 7.

“ 10, 12. T. ALTERNATUS, Say. (See plate 13, fig.
16.)

MORMUS.

“ 6. M. SUFFLATUS, Gould. Otia Conchologica, p.
184, 1862.

Bul. vesicalis, (pre-oc.) Gould. Bost. Jour.,
vi., p. 375, t. 14, f. 1, Apr., 1852. No. 1.

“ 7. M. PILULA, W. G. Binney. Proc. Acad. Nat.
Sciences, p. 332, 1861. No. 2.

SCUTALUS.

“ 8. S. PROTEUS, Broderip. Proc. Zool. Soc., p. 107,
1832.

Bul. sordidus, Reeve. Conch. Iconica, Buli-
mus, f. 100. No. 1.

“ 9. S. DEALBATUS, Say. Jour. Acad. Nat. Sciences,
ii., p. 159, Jan., 1821.

W. G. Binney, l. c. iv., p. 130, t. 80, f. 6, 7,
1859.

Bul. dealbatus, (Part) Binney, l. c. ii., p. 276,
t. 51, f. 1, (excl. other figures,) 1851. No. 2.

“ 11. S. XANTUSI, W. G. Binney. Proc. Acad. Nat.
Sciences, p. 331, 1861. No. 3.

MESEMBRINUS.

(See also pl. 13.)

“ 21. M. INSCENDENS, W. G. Binney. Proc. Acad.
Nat. Sciences, p. 332, 1861. No. 3.

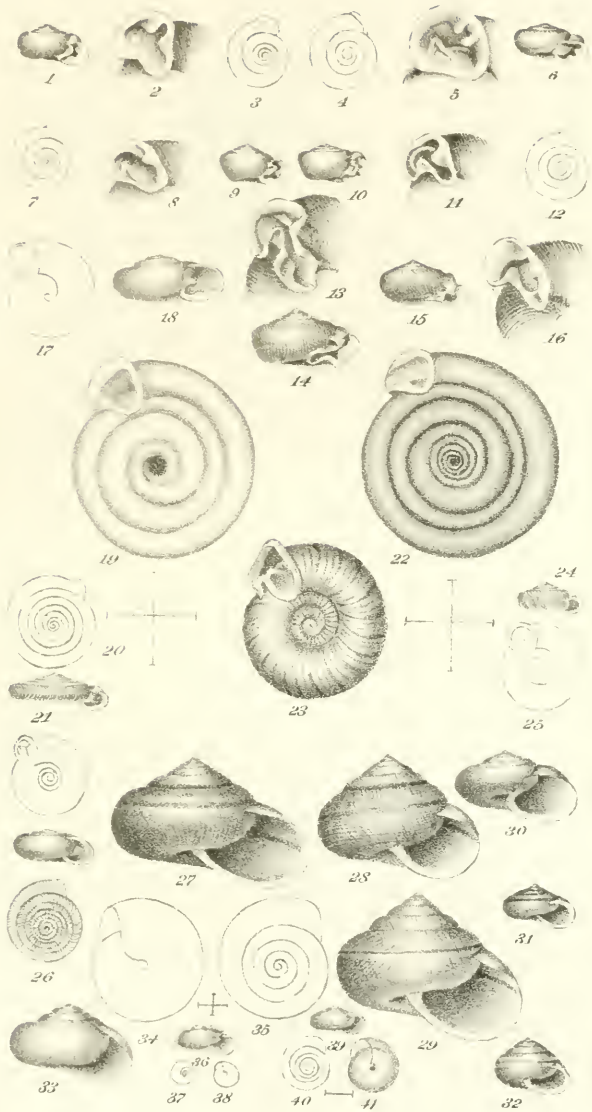
PERONÆUS.

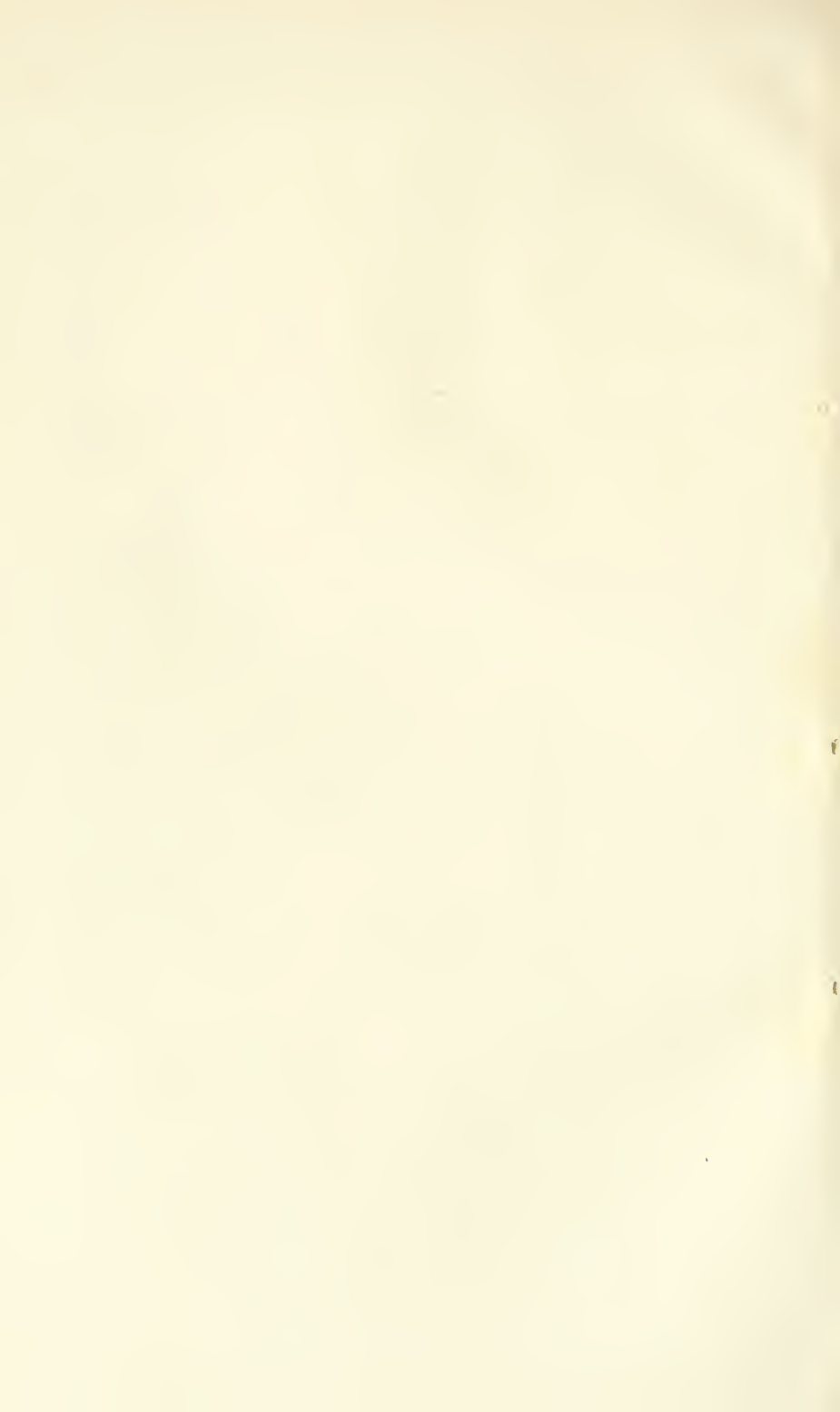
“ 22. P. ARTEMESIA, W. G. Binney. Proc. Acad.
Nat. Sciences, p. 331, 1861. No. 1.

SYNOPSIS OF THE GENERA SYCOTYPUS, BROWNE, AND
BUSYCON, BOLTEN.

BY T. A. CONRAD.

The name of *Sycotypus* is applied to the genus *Ficus*, Klein, (*Ficula*, Swainson,) by Adams and Hermannsen on the authority of Gronovius, who quotes it with a mark of doubt. There is no shell of the West Indies that answers to the simple designation of "smaller hairy fig shell, lightly tuberculated," but it is very probable that the shell known as *Bulla canaliculata*, Lin., was in the collections in Jamaica, and regarded as a native. The description does not apply to any species of *Ficus*, for the simple designation "hairy" would alone distinguish Browne's genus from *Ficus*. We have no knowledge of any anatomical characters by which to separate this genus from *Busycon*, Bolten, which was founded on *Murex aruanus*, Lin., but as the two groups have very characteristic differences in the shells, one being spinous and the other channelled and tuberculated, the one having reversed species, the other never reversed, it is most convenient to regard them as distinct genera, especially as the embryo in the egg pouches of *B. aruanum* have a long fissure, parallel with the columella, which exhibits the interior to the apex, and the embryo of *S. canaliculatus* is always entire. I do not think the partial union of the characters of the two groups, as represented by the Miocene fossils, should decide us to retain the whole group under one generic term; for, otherwise, very many recent genera would have to be eliminated for the same reason. But it is remarkable that this trenchant distinction between *Sycotypus* and *Busycon* should have taken place so soon after the Miocene period, in which several species of shells can scarcely be distinguished from living shells of the coast.







1



3



2



4



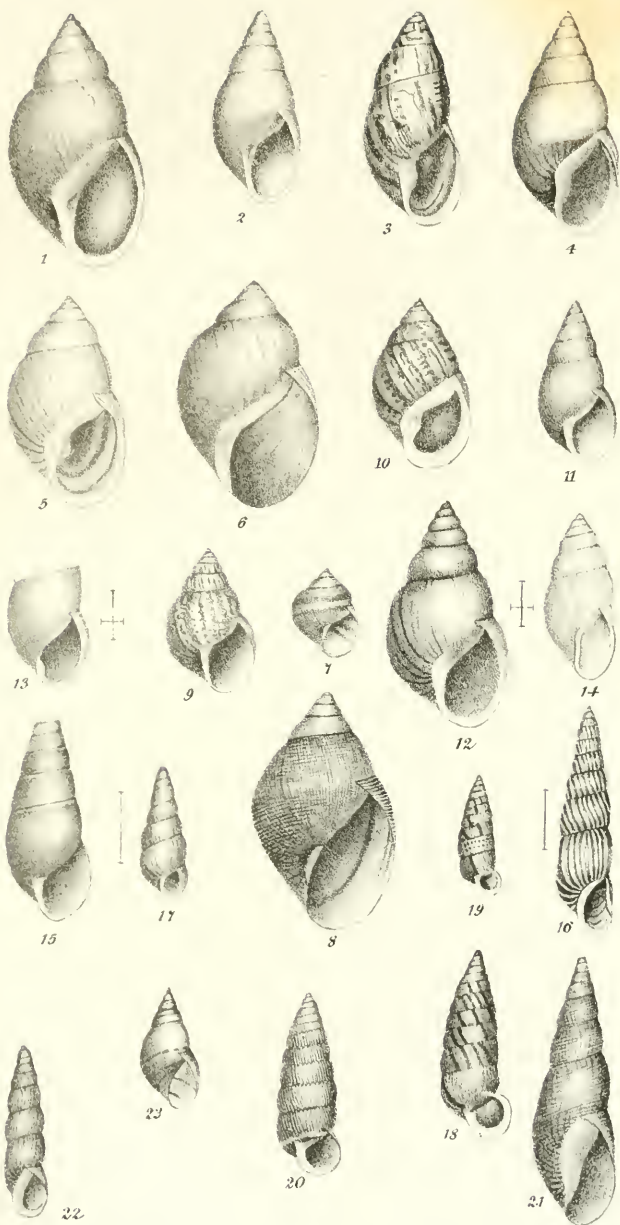
5



6



1824





The geographical distribution of these two genera of large univalves, both in the recent and fossil state, is very interesting, inasmuch as the recent forms belong exclusively to the coasts of the West Indies, the Gulf of Mexico and the North Atlantic, and the fossils to the tertiaries of the Atlantic slope.

Whilst the distinction between spinous and tuberculated forms is quite decided amongst the recent shells of the two genera, it is less marked in the fossils, and all are alike, when young, in having tubercles only. The difference is that in one genus the tubercles remain in the adult, but in the other, in a certain stage of growth, they become, though not invariably, open or foliated spines. This fissure is in the direction of the shell's growth, and is the only difference between the spines of *B. aruanum* and the tubercles of *S. coronatus*. The spines sometimes appear to be a prolongation of certain prominent lines of growth in the shell. This character seems to have suggested the name *aruanum* applied to the typical species.

Quite young shells of the canaliculate group, as *S. coronatus* and *rugosus*, are not canaliculate.

There is no prominent fold on the columella of these genera, but only a slight oblique groove.

The first of this group of genera or subgenera appears to have originated in the Eocene, but it is only in the Miocene that it assumes its maximum development and marked diversity of characters and forms.

The species of *Sycotypus*, figured by Lister, t. 878, is unknown to me. Dillwyn refers it to *canaliculatus*, but the adult, young shell, embryo and ovaries are all very different from those of *canaliculatus*.

SYCOTYPUS, Browne, Gill, (not Gronovius).

Recent species.

- S. CANALICULATUS, Lin.
- 1. S. PLAGOSUS, Conrad.
var. elegans, Conrad.
- 2. S. PYRUM, Dillwyn.
Fulgur pyruloides, Say.

Miocene species.

- S. ALVEATUS, Conrad.
- S. CORONATUS, Conrad.
- S. CAROLINENSIS, Conrad.
- S. CANALIFERUS, Conrad.
- 3. S. INCILIS, Conrad.
- 4. S. EXCAVATUS, Conrad.
Cassidulus carolinensis,
Tuomey and Holmes.
- S. RUGOSUS, Conrad.

BUSYCON, Bolten.

Recent species.

5. B. ARUANUM, Lin.
Pyrgula carica, Lam.
B. spinosum, Conrad.
 6. B. ELICEANS, Montfort.
 B. CANDELABRUM, Lam.
 B. COARCLATUM, Sow.

Miocene species.

- B. FILOSUM, Conrad.
 7. B. MAXIMUM, Conrad.
 B. TRITONIS, Conrad.

Reversed species.

- B. KIENERI, Phillippi.
B. gibbosum, Conrad.
 B. PERVERSUM, Lin.

Oligocene species.

8. B. SPINIGER, Conrad.
 9. B. ADVERSARIUM, Conrad.

Subgenus SYCOPSIS, Conrad.

Tuberculate, not canaliculate.

Miocene species.

- B. CARINATUM, Conrad.
 B. FUSIFORME, Conrad.
 B. SCALASPIRA, Conrad.
 10. B. STRIATUM, Conrad.
 B. TUBERCVLATUM, Conrad.

Eocene species.

11. B. NODULATUM, Conrad.

Reversed species.

- B. CONTRARIUM, Conrad.

In this subgenus there are seven species which have no living representatives, or forms possessing the same subgeneric characters.

NOTES.

1. *S. plagosus*. The reference to Lister in Proceedings of Academy, 1862, is an error. It should be to Chemnitz, iii., 738. It is figured by Kiener as a variety of *S. canaliculatus*, pl. 10, fig. 2. *S. elegans*, Conrad, is a variety.

2. *S. pyrum*. The tubercles are only in the young shell, or near the apex in the adult.

3. *S. incilis*. Tuberculated like the preceding. It is the only thick and ponderous shell of the genus.

4. *S. excavatus*. Tuberculated like the preceding. In this species the spiral channel assumes the character of a profound canal, which eminently distinguishes it from all the other species.

5. *B. aruanum*. Linne's original description and references to figures in Rumphius and Gualteri apply to the same species described by Lamarek as *Pyrula carica*, and by myself as *B. spinosum*.

6. *B. eliceans*. This shell is usually confounded with the preceding, but it is evidently distinct, and inhabits the southern coast exclusively, whilst the *aruanum* ranges as far north as Massachusetts. It is represented in Montfort's figure; in Reeve's Mon. of *Pyrula*, pl. 5, fig. 16; in Chemnitz, fig. 744, 756—7; Tuomey and Holmes, Post-Pliocene of S. C., pl. 11, fig. 1; Kiener. Mon. of *Pyrula*, pl. 3, fig. 1.

7. *B. maximum*. Chiefly distinguished from *Tritonis* by the absence of spines in the adult.

8. *B. spiniger*. In this species the armature is similar to that of *Sycotypus coronatus*, and forms a connexion between the tuberculated and spinous shells of the two genera.

9. *B. adversarium*. This species is the only reversed form with tubercles instead of spines.

10. *B. striatum*. This shell, though young, is a very distinct species; even the just excluded young of *Sycotypus canaliculatus* can be easily recognized, so as not to mistake it for that of any other species.

11. *B. nodulatum*, Conrad. In this, the oldest known species, there are tubercles and no channel; so that *Sycotypus* dates no further back than the Miocene, which contains seven species.

S. canaliculatus. As Dr. Gould remarks that there is some uncertainty of the species described by Linne under this name, I would refer to the Syst. Nat., 1758, where the habitat Canada is given, and the reference to Gualteri, pl. 48, removes all doubt. That is an excellent figure of the shell known as *canaliculatus*, and is placed by Linne in the genus *Murex*.

DESCRIPTIONS OF NEW MIOCENE SHELLS.

BY T. A. CONRAD.

SYCOTYPUS, Browne.

S. PYRIFORMIS, Conrad.

More acutely angular on the shoulder than *S. pyrum*. The body whorl does not swell out beyond the line of its summit, as in *pyrum*.

Cassidulus pyrum, Tuomey and Holmes. Pliocene Fossils of South Carolina, pl. 30, fig. 2.

FICIDÆ.

FICUS, Klein.

F. HOLMESII, Conrad.

Much less ventricose and more closely striated than *reticulatus*, and having a longer beak.

Sycotypus reticulatus, Tuomey and Holmes, (not Say.) Pliocene Fossils of South Carolina, pl. 30, fig. 3.

FASCIOLARIDÆ?

FASCIOLINA, Conrad.

Fusiform; columella nearly straight to the extremity of the beak; one prominent oblique fold on the columella, situated above the middle of the aperture.

Fasciolaria Woodii, Gabb.

This is a small, thick, very fusiform shell, with a fold situated more remote from the beak than in any other uniplicate genus, except *Cuma*, Humph.

BUCCINIDÆ.

TORTIFUSUS, Conrad.

Fusiform; ribs revolving; columella with a slight oblique groove as in *Sycotypus*; beak long, twisted; lip entire within.

Lirosoma curvirostra, Conrad, Proc. Acad. Nat. Sciences, 1864, p. 212.

This shell differs from *Lirosoma* in being without longitudinal ribs or varices, and without a prominent fold on the columella, which is very similar to that of *Sycotypus* with its oblique, slight groove. It differs from the species of the latter genus in its prominent equal revolving ribs, and want of lines on the interior of the labrum.

NOTES ON FOSSIL SHELLS AND DESCRIPTIONS OF NEW SPECIES.

BY T. A. CONRAD.

SOLENIDÆ.

LEPTOSOLEN, Conrad.

This genus is very nearly allied to *Solena*, Browne, but, having obtained a more complete view of the interior since the generic character was published, I find that the anterior muscular impression is chiefly anterior to, though its posterior end nearly covers, the rib, which is prominent in the umbonal region, truncated behind, sloping anteriorly, and situated behind the line of the apex. The upper margin of the muscular impression is on a line with the interior hinge line. In *Solena* the tooth is narrowest on the hinge plate, and there is a small pit before it; but in *Leptosolen* the tooth is broadest on the hinge plate, and tapers to a very acute edge, which is expanded in the direction of the shell's diameter.

ANATINIDÆ.

PERIPLOMA, Schum.

The *Anatina alta*, C. B. Adams, proving to be a *Periploma*, it is necessary to substitute another name for *P. alta*, Conrad, figured in Am. Journ. Conch., vol. ii., pl. 4, fig. 10. I propose the name *P. peralta*, Conrad.

MACTRA, Lin.

M. VIRGINIANA, Conrad.

Description.—Triangular, elongated, hatchet-shaped, equilateral, compressed; anterior subcuneate, obliquely truncated at

the extremity; umbonal slope very oblique, straight, carinated, margined by a wide angular depression; posterior side flattened; dorsal margins oblique, straight; lunule profoundly elongated, impressed, with angular margins, but not defined by an impressed line; ventral margin equally rounded, and the extremities much above the line of the base; hinge teeth compressed, elevated; fosset large, oblique; pallial sinus acutely rounded.

Dimensions.—Length $4\frac{3}{4}$ inches; height 3 inches.

Locality.—Yorktown, Virg.

Observations.—This species has been considered a variety of *S. delumbis*, Con., from the same locality, but it is compressed, whilst the latter is ventricose, and its rounded ventral margin, straight posterior dorsal line, narrower umbo, &c., give it a different external character; the hinge plate is broader, thinner, and the posterior tooth longer than in *S. delumbis*. It has, perhaps, the most graceful form to be found in the family.

List of Miocene Species of Hemimactra, Swainson.

H. congesta, Conrad.

H. subparilis, Conrad.

H. confragosa, “

H. modicella, “

H. subeuneata, “

H. medialis, “

PECTINIDÆ.

PECTEN, Lin.

P. TRICARINATUS, Conrad.

Description.—Right valve slightly ventricose; left valve slightly convex, posterior ear sinus not profound; ribs 15, narrow, square, elevated, each with three prominent equal scaly lines; interstices much wider than the ribs, with six or seven minutely scaly lines, the middle one generally largest; in the left valve, the three lines on the ribs have an intermediate line and the ribs are rather wider. Height $3\frac{3}{8}$ inches; length the same.

Locality.—Virginia. Miocene.

PECTEN YORKENSIS, Conrad.

Description.—Orbicular, thin, depressed; umbonal region convex; ribs 21, subquadrate, little prominent; interstices about as wide as the ribs, with transverse wrinkles, which are obsolete on the ribs. Height $1\frac{3}{4}$ inches; length $1\frac{7}{8}$ inches.

Locality.—Yorktown, Virginia. Miocene.

Closely resembles *P. irradians*, Lam., but has much less prominent ribs, and is not ventricose.

VENERICARDIA, Lam.

V. MOOREANA, Conrad.

Description.—Cordate, thick, ventricose; ribs 27 or 28, flattened on the back, prominent, square, broader on the back than beneath, or the interstices are narrowed at the surface by a slight lateral carination of the ribs; ribs prominent to the ventral margin; narrow, close and prominent on the anterior and posterior slopes; crenulated on the beak and umbo. Length $1\frac{1}{8}$ inch.

Locality.—Texas. Dr. Francis Moore. Eocene.

Distinguished from *planicosta* and *densata* by its size, by the prominence of the ribs on the margin of the valves, and on the anterior and posterior slopes, and by the interior marginal teeth which are not carinated on the margins.

DESCRIPTION OF A NEW GENUS OF ASTARTIDÆ.

BY T. A. CONRAD.

CYCLOCARDIA, Conrad.

Rounded, equivalve, radiately costate, covered with a rough epidermis; hinge with two robust teeth in the left valve, directed obliquely backward, the posterior one elongated and slightly curved; anterior tooth of the right valve rudimentary; pallial impression entire.

Cardita borealis, Conrad.

This genus differs from *Cardita* in being of a less dense structure of the valves, which are often eroded on the ribs, and in having a rough, brown epidermis covering a white unspotted shell. The anterior cardinal tooth is directed obliquely backward, unlike that of *Cardita*, and the anterior muscular impression is comparatively longer than in that genus, whilst its northern habitat is very different from that of the *Cardite* which inhabit the Mediterranean and tropical seas.

The epidermis, when magnified, shows fine close lines following the direction of the ribs.

C. ventricosa, Gould, has a similar form and epidermis, and inhabits Puget Sound, thus agreeing in every essential character with its congener *C. borealis*.

DESCRIPTIONS OF NEW WEST COAST SHELLS.

BY T. A. CONRAD.

MACTRIDÆ.

HARVELLA, Gray.

H. PACIFICA, Conrad.

Description.—Equilateral, ventricose; posterior extremity situated midway between the summit and ventral margin, which is regularly and profoundly rounded; post umbonal area narrow and depressed.

Inhabits Panama.

Observations.—Differs from the Florida species, *H. elegans*, in being less ventricose, having much finer and closer ribs on the umbo, in having the posterior angle situated much higher, in having a narrower post-umbonal area; in the anterior cardinal cavity being much wider, and in the ribs being less distant.

I have no doubt of the independent origin of these two species, nor do I believe that the Isthmus faunæ of the two oceans contained originally, if they do now, any identical species. C. B. Adams thought there was one shell common to both oceans—*Crepidula unguiformis*—but as that shell is occasionally rayed in the Panama specimens, and never in the Atlantic species, I have no doubt of their being distinct. It has been supposed that the two oceans communicated in the Miocene Period, but, in that case, there would have been little distinction between the shells of each ocean; but, in fact, the Miocene analogues are of the Pacific type on the west, and of the Atlantic type on the east, where they resemble recent American shells. Since the Miocene period, there is no evidence of a subsidence, and I believe that it was the elevation of land at the close of the Oligocene Period that separated the Atlantic and Pacific oceans. I find

several Eocene shells common to the Atlantic and Pacific slopes, among which is the well-known *Venericardia planicosta*, Lam.

The shells of the Isthmus Tertiary are different from Eocene or Miocene shells of N. America.

SPISSULA, Gray.

S. CATILLIFORMIS, Conrad.

Description.—Suboval, inequilateral; anterior side slightly flattened or contracted; posterior side with an oblique shallow groove or fold; lines of growth coarse and prominent; lunule very long, elliptical; ventral margin tumid posteriorly; cardinal pit oblique, large; pallial sinus extending beyond the middle of the valve. Length $4\frac{5}{8}$ inches; height $3\frac{7}{8}$ inches.

Inhabits Panama.

SPISSULA DOLABRIFORMIS, Conrad.

Description.—Triangular, equilateral, slightly ventricose, anterior side somewhat produced, subcuneate, rounded at the end; ventral margin regularly rounded anteriorly and medially; umbonal slope with a slight carinated line, and a distinct fold anterior to it; post umbonal area with an angular groove; epidermis yellow olive, much wrinkled on the carinated line and post-umbonal slope; posterior end obliquely truncated, sub-emarginate; pallial sinus extends not to the middle of the valve, but opposite the posterior end of the fosset.

Inhabits Panama.

Somewhat like *Mactra exoleta* in outline, but less elevated, and not so ventricose.

SILIQUEA Mühlfeldt.

SILIQUEA CALIFORNICA, Conrad.

Description.—Oblong, equally rounded at the ends, compressed, umbo with a broad dark violet ray; the rib representing a yellowish ray distinct to the apex; posterior to the umbonal ray is a broad yellow ray which is terminated suddenly at a violet concentric line; rib oblique; cardinal teeth diverging in the right valve; 3 in the left; the two anterior teeth direct and approximate; pallial sinus angular at the extremity.

Inhabits Body Bay, Calif. George Davidson. Length $1\frac{7}{8}$ in.

The ray on the umbo, the more oblique rib, and especially the angular sinus of the pallial line, will suffice to distinguish this beautiful shell from *S. patula* of the Sandwich Islands.

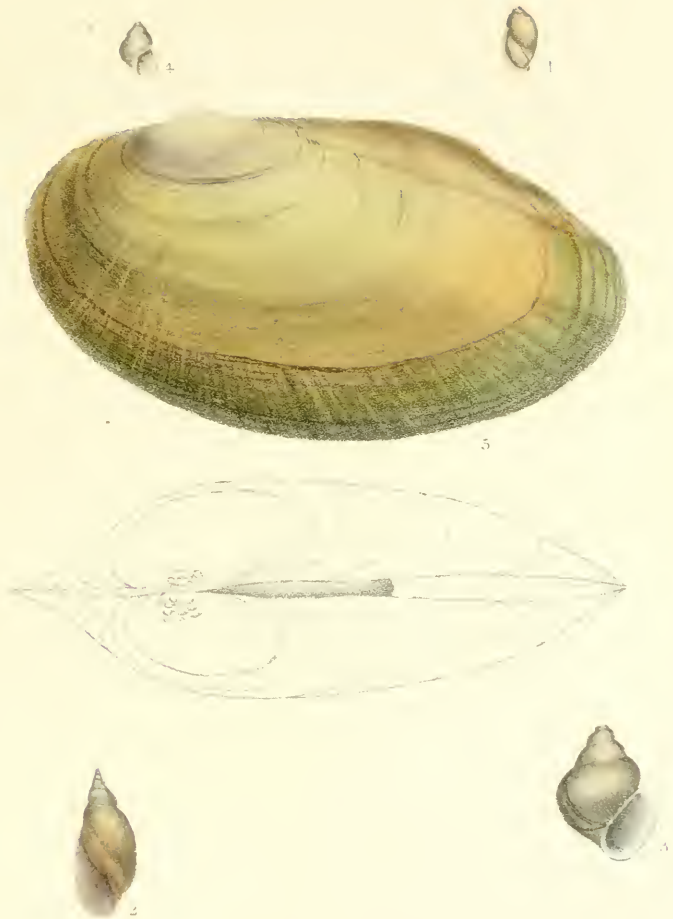
DESCRIPTION OF A NEW SPECIES OF LIMNEA

BY S. S. HALDEMAN.

LIMNEA TECHELLA, Hald.—Plate 6, fig. 4.

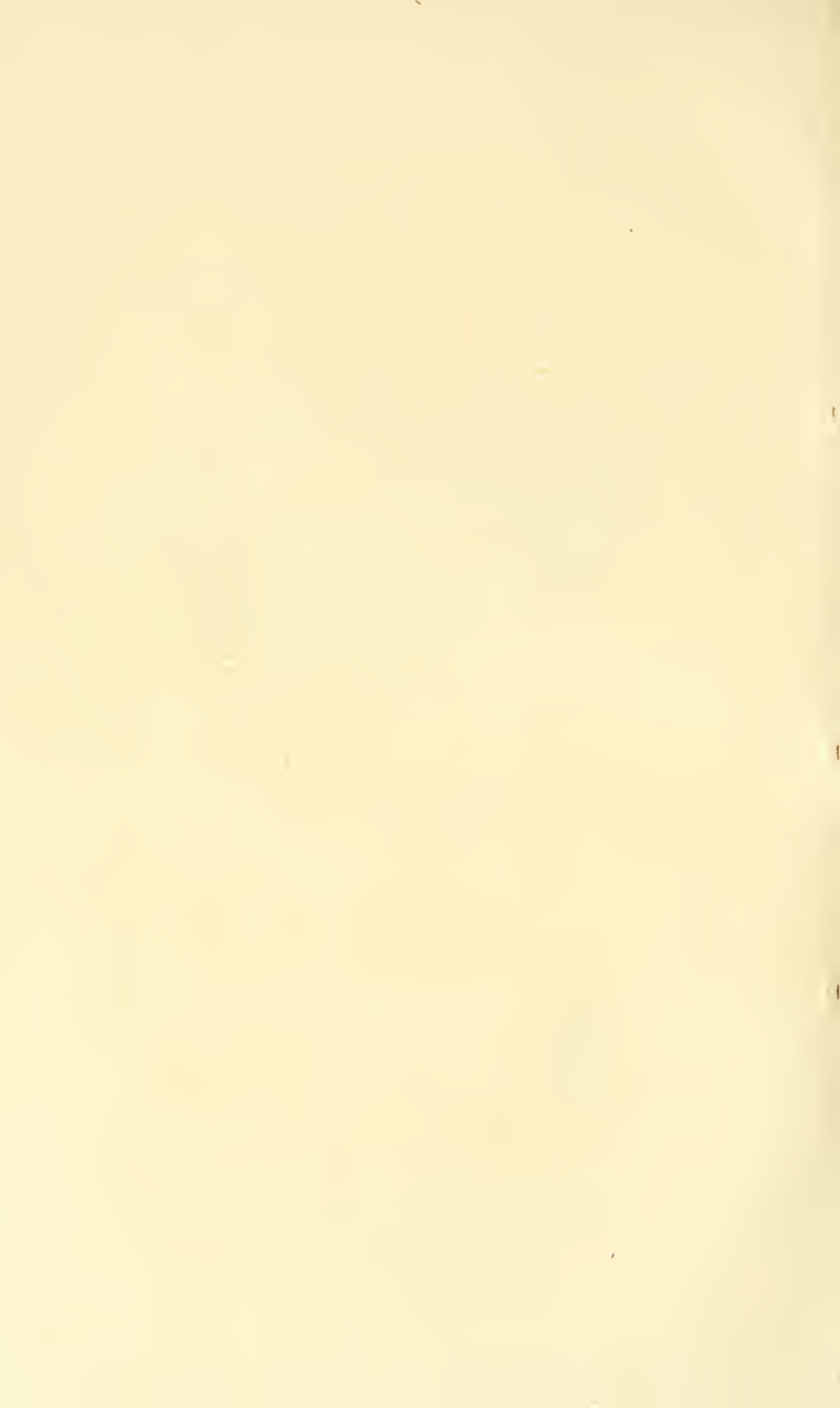
Testâ curtâ, inflatâ, perforatâ, diaphanâ, pallide viridi-ochraceâ, politâ; anfractibus 5 convexis; aperturâ amplâ, interne subangulata. Long. 3—4 lin. (6—10 millim.) Texas.

Surface smoother than in *L. bulimoides*, Lea, of Oregon, with the lines of accretion less apparent, and the labium more angular. In some individuals the shell is thick enough to be corroded.



1 *Physa deformis* Currier 3 *Melantho gibba* Currier.
 2 *Physa Teyoni* .. 4 *Lamnea litchella* Haldeman
 5 *Anodonta subcarinata* Currier

Drawn by J. E. Smith.



NOTICES AND REVIEWS OF NEW WORKS.

BY GEORGE W. TRYON, JR.

I.—AMERICAN.

Land and Fresh Water Shells of North America. Part 2. Pulmonata, Limnophila and Thalassophila. By WM. G. BINNEY. Smithsonian Miscellaneous Collections. 8vo. Washington, 1865.

This work, which professes to monograph all the species of Auriculidæ, Limnæidæ, and Siphonariidæ inhabiting the United States, published prior to 1864, forms a volume of 161 pages, illustrated by over 250 excellent wood engravings, made from drawings from nature, by the experienced pencil of Mr. Edw. S. Morse.

The exceeding conservatism which characterizes all of Mr. Binney's writings, in the present instance is greatly to be deplored, as many perfectly good species, acknowledged to be such by all other American conchologists who have studied our fresh water shells, are degraded from that rank to synonyms only. It must be conceded to Mr. Binney's fairness in his work that he has been quite as conservative in his study of new forms as of those already described: thus, he leaves in *Physa heterostropha* all the various species from every section of the country, which, labelled by collectors under that convenient all-embracing name, have passed through his hands, instead of anticipating Mr. Isaac Lea and myself in the description of them. A naturalist who confounds (and in the name and under the authority of the Smithsonian Institution) twenty to thirty species in one, can scarcely be considered a safe exponent of the subject, particularly for that class of conchologists for whom this book is principally designed—the *beginners* in the science. In order to correct as nearly as possible the false impressions which may be given by this work to such persons, we will briefly rectify what we conceive to be its more glaring errors. (Practised concholo-

gists will not need to follow us in this, for they will know how to extract the very valuable information which the book contains without accepting its conclusions.)

We agree with Mr. Binney in uniting *Limnæa umbrosa* with *L. reflexa*. He has confounded with them *L. Rowellii* and *L. zebra*, nob.

We believe *L. Sumassi*, Baird, to be correctly represented by figs. 56 and 57, but the following figure (58) is a very doubtful representation: we call it *L. ampla*, Mighels.

L. macrostoma, Say, is surely distinct from *L. columella*. To the synonymy of the latter must be added *Succinea pellucida*, Lea.

L. Nuttalliana, Lea, is not a synonym of *L. palustris*; and *L. obrussa*, Say, is very different from *L. desidiosa*, of the same author.

Of the synonyms of *desidiosa* it may be remarked that *L. Philadelphia*, Lea, is certainly a synonym, but a personal examination of Mr. Lea's *L. acuta* leaves me in considerable doubt whether it is not a distinct species; but a few specimens of *acuta* were obtained, and I have never seen any shells like them in collecting in the vicinity of the locality where they were discovered. Mr. Lea's species should at least have the benefit of the doubt, since it has been described as new. *L. fusiformis*, of Lea, is certainly a synonym of *L. obrussa*. *L. Jamesii*, Lea, is a distinct species, belonging to this group.

L. catascopium, Say. *L. pinguis*, Say, is distinct. *L. Virginiana*, Lam., is certainly an exotic, probably an Indian species. Fig. 86, doubtfully referred to this species by Mr. Binney, represents *L. Brownii*, nob., originally described from Elyria, Ohio.

L. humilis, Say. *L. modicella* is distinct. *L. parva* and *exigua*, Lea, are synonyms of the former, and *L. curta* and *plica*, Lea, of the latter; while *L. Griffithiana*, Lea, is very distinct.

L. platystoma, Haldeman. This species is evidently *L. limosa*, Linn. I have specimens exactly like the figure.

It would be useless to enter into a review of Mr. Binney's list of admitted species of *Physa*, as his views differ so entirely from my own. Suffice it to say that he does not admit more than thirty species, while I extend the number beyond sixty published species, besides many unpublished ones in my cabinet, and that most of these additional species are forms of what Mr. Binney considers *P. heterostrophæ* and *P. gyrina*.

Planorbis glabratus, Say, "is said to be found in Oregon." I do not know who is authority for this assertion, which is cer-

tainly incorrect, as the species is southern in distribution. Possibly the Oregon species thus referred to is the *Pl. suberenatus*, of Carpenter, which is closely related in general appearance.

Pl. corpulentus, Say. I agree with Mr. Binney in considering this shell synonymous with *Pl. trivolvis*, and that the West Coast shells usually referred to *corpulentus* constitute a new species. As Mr. Binney has indicated this species, but neglected to name it, I propose for it the following name and synonymy:

PL. BINNEYI, Tryon.

Pl. corpulentus (not of Say). Gould, U. S. Expl. Exped., p. 114, f. 130. 1852.

Haldeman, Monog. Limniades, p. 19, t. 3, f. 7-9. 1844.

W. G. Binney, Monog., p. 114, f. 191, 192. 1865.

Mr. Binney's figure 193 does not represent a form of this species, but rather of *P. Ammon*, in my judgment.

Pl. regularis, Lea, is a shell totally distinct from *Pl. trivolvis*; it is a higher species, subearinate, with the umbilicus very shallow. It exists abundantly wherever *trivolvis* and *bicarinatus* are found. The California and Oregon shells referred by Mr. Binney to *trivolvis* are probably *tenuis*, Phil., as *trivolvis* is not an inhabitant of the West Coast.

Pl. exacutus, Say. *Pl. Buchananensis*, Lea, is not a synonym of this species but = *dilatatus*, Gould.

Land and Fresh Water Shells of North America. Part 3. Ampullariacæ, Valvatidae, Viviparidae, Fresh Water Nassoidæ, Cyclophoridæ, Truncatellidæ, Fresh Water Neritidæ, Helicidæ. By WM. G. BINNEY. Smithsonian Miscellaneous Collections. 8vo. Washington, 1865.

This volume contains 120 pp. 8vo, and is illustrated, like the former one, with numerous wood engravings, by Mr. Morse.

The species belonging to these operculate families being more readily distinguishable than those of the *Lymneans*, I have fewer criticisms to make. My *Vivipara Texana*, confounded by Mr. Binney with *V. subpurpurea*, of Say, has already been recognized as distinct in Mr. Reeve's Monograph of the genus *Vivipara*, recently published in his Conchologia Iconica. *V. multicarinata*, Haldeman, is certainly an Indian, not an American species. Mr. Binney recognizes our so-called *V. vivipara* as distinct from the European species, but for very insufficient reasons substitutes the specific name *contectoides* for *lineata*, Küster (not Valenciennes). The name in Küster of course is a misprint for *lineata*, and his description and figure are accurate. The Florida specimens referred to *V. contectoides* are perhaps my *V. Waltoni*. *Vivipara obesa*, Lewis, *genicula*, Conrad, and

subsolida, Anth., are all distinct from *V. integra*, Say. If *V. Milesii*, Lea, is not also a distinct species, it is a synonym of *subsolida* rather than of *decisa*. *V. Bengalensis*, Lam., said to be found in Florida, is my *V. Waltoni*.

The portion of the work referring to Fresh Water Rissoidæ is in its arrangement identical with Dr. Stimpson's classification of these shells.*

The figure of *Tryonia clathrata* is not at all characteristic. *Somatogyra integer* and *pumilus* are different species.

Melantho De Campi, Currier, is figured and described in the Appendix, with the following observation: "About a dozen specimens were collected. All but the one drawn in fig. 227 could not be distinguished from *Melania* without the presence of the operculum, thus furnishing another example of the impossibility of ascertaining from the shell alone the generic position of the species. It is probable that other species of *Melantho* have been described as *Melaniæ*."

When Mr. Binney received specimens of this species he showed them to me without the opercula, and asked me to assign their generic position. I instantly referred them to *Melantho*. He then called my attention to their extraordinary resemblance to *Melania*, but this resemblance I entirely failed to perceive. In fact they no more resemble the latter genus than does any other species of Viviparidæ, and I am certain that no person acquainted with the two genera would confound them. Mr. Binney's illustration of the impossibility of determining genera by the shell alone is thus quite as unfortunate as those given by Dr. J. E. Gray, in an elaborate memoir published many years since, *and every one of which are readily distinguished* by the shell only.

Gillia ——? from Stephenson, Ala., and Powel's River, Tenn., is *G. parvula*, Tryon, published in Vol. I. of this Journal.

Catalogo de los Moluscos Terrestres y Fluviales de la Isla de Cuba. By RAFAEL ARANGO Y MOLINA. 8vo., 78 pp. Havana, 1865.

This is a very complete catalogue, with copious synonymy, localities and notes, and an introduction by Dr. Felipe Poey. The paper is extracted from the "Repertorio Fisico-natural, de la Isla de Cuba."

* See my review of Dr. Stimpson's work, Am. Jour. Conch., ii., p. 152, 1866.

II.—FOREIGN.

BRITISH.

Generic Forms of Shells Illustrated.

Mr. G. B. Sowerby (45 Great Russell Street, Bloomsbury, London) announces for early publication a work with the above title. The price is not yet fixed, but is expected to be about £3 3s. "The illustrations will be copious and of full size, embracing every marked form, whether recent or fossil, and whether adopted as a genus or not."

Memoirs of the Literary and Philosophical Society of Manchester. 3d Series. Vol. 2. 8vo. London, 1865.

On the Tongues of Mollusca. By THOMAS ALCOCK, M. D.

An excellent paper, of a semi-popular character. Illustrated by 4 plates, drawn by the Author.

Thesaurus conchyliorum, or Figures and Descriptions of Recent Shells. By G. B. SOWERBY. Parts 24, 25. 8vo. London: published by the author, 1866. (Price 50s. 6d.)

These parts complete the third volume, and the present series of the "Thesaurus."* The following are the contents of the present parts:—

Second Monograph of the genus Helicina, including the genera Trochatella, Lucidella, Helicina, Schasischeila and Alcadia, of authors.

This monograph contains 13 plates with 479 figures. The following are the new species:—

<i>H. semistriata</i> ,	Hab.—?	<i>H. subconica</i> ,	Hab.—?
" <i>crassicosata</i> ,	" ?	" <i>tenuilabris</i> ,	" ?
" <i>tricarinata</i> ,	" ?	" <i>subovalis</i> ,	Jamaica.
" <i>unicarinata</i> ,	" ?	" <i>Zoe</i> , Pfr.,	Cuba.
" <i>inconspicua</i> , Pfr.,	" ?	" <i>aurantio-viridis</i> ,	Hab.—?
" <i>subturrita</i> ,	" ?	" <i>tecta</i> ,	" ?

Monograph of the genus Carinaria, with 1 plate.

Monograph of the genus Donax, Linn., 4 plates, 117 figures.

The following are new:—

* A new series is announced for early publication, commencing with a monograph of *Cypræa*.

<i>D. acuticarinatus</i> ,	Siam.
" <i>curtus</i> ,	Caraccas Bay.
" <i>angustatus</i> ,*	United States.
" <i>inconspicuus</i> ,	Hab.—?

Monograph of the genus Typhis, Montf., 1 plate, with 21 figures.

Monograph of the genus Trichotropis, 1 plate, with 17 figures.

Appendix to Monograph of the genus Conus, 4 plates.

The following are new :—

<i>C. compressus</i> ,	Hab.—?	<i>C. quadratomaculatus</i> ,	Hab.—?
" <i>roseo-tinctus</i> ,	" ?	" <i>acutimarginatus</i> ,	" ?
" <i>excavatus</i> ,	" ?	" <i>turriculatus</i> ,	" ?
" <i>nigrescens</i> ,	" ?	" <i>concinus</i> ,	" ?
" <i>proximus</i> ,	" ?	" <i>Borneensis</i> ,	Borneo.
" <i>Tasmanice</i> , Sowb., Tasmania		" <i>complanatus</i> ,	Australia.

Monograph of Cerithium. Supplementary Plate.

The following are new species :—

<i>C. tenuifilum</i> ,†	Philippines.	<i>C. coarctatum</i> ,	Hab.—?
" <i>undatum</i> ,	Hab.—?	" <i>Afrum</i> ,	" ?
" <i>tenuipunctatum</i> ,	" ?		

Monograph of Eburna. Supplementary Plate.

The following are figured, *all new* !—

<i>E. semipicta</i> ,	Sowb.,	Hab.—?
" <i>Borneensis</i> ,	"	Borneo.
" <i>chrysostoma</i> ,	"	Ceylon.
" <i>Formosae</i> ,	"	Formosa.

Annals and Magazine of Natural History. XVIII., No. 105. Sept., 1866.

On Green Oysters. By ARTHUR W. E. O'SHAUGHNESSY, of the British Museum.

This paper we copy in the present number of this Journal. It will be found well worthy of perusal.

XIX., No. 109. JANUARY, 1867.

On the Perforate Structure of the Shell of Spirifer cuspidatus. By WM. B. CARPENTER.

* = *D. fossor*, Say, which Sowerby has not identified.

† Instead of *C. filum*, Conch. Icon. 82, which is preoccupied.

In this communication Prof. Carpenter emphatically denies that the above species is punctate, as asserted by Prof. F. B. Meek in the Am. Jour. Science for May, 1866, and suggests that the shells examined by Prof. M. belong to a different genus.

Journal of the Asiatic Society of Bengal. 1866. Part 2. Calcutta.

Contributions to Indian Malacology, No. VII. List of species of Unio and Anodonta, described as occurring in India, Ceylon and Burma. By WM. T. BLANFORD.

The above paper is by no means so complete as its title indicates,—the omissions of species are numerous and important, and the synonymy in many cases incorrect. The list of authorities quoted by Mr. Blanford is so meagre that we are not surprised at this result, but we are astonished that a good conchologist should undertake to decide upon the validity of genera and species whereof he has not seen even descriptions or figures, much less specimens. We much doubt whether Mr. Blanford has ever seen as extensive a collection of Unionidæ from the countries named as can be produced at this moment by a few gentlemen residing in Philadelphia and its environs.

The paper of Mr. Blanford is, however, despite these defects, an excellent one, and, by directing inquiry to the subject at home, will doubtless stimulate research and elicit truth. There are many valuable notes on synonymy and distribution, and one of the latter is curious. In speaking of *Unio Wynegungaensis*, Lea, Mr. Blanford remarks: "The locality given by Lea is Wynegunga river, east of Nagpoor in the Deccan, Bengal, which is equivalent to talking of Philadelphia, in New England, Virginia."

We do not consider the names of Indian shells given by Rafinesque so *entirely* worthless as supposed by Mr. Blanford. The genus *Diplasma*, proposed by Rafinesque,* is surely distinct from *Unio*. It comprises a large number of Southern Asiatic Unionidæ.

It is a mistake to confound *U. crispatus*, Gould, with *U. crispuleatus*, Benson. The difference of form is as great as that between *U. nasutus* and *U. rubiginosus*. Mr. Blanford has not seen the former, but in the United States neither of them is uncommon; while the species described by Morelet, *U. pellis-lucerti*, and not mentioned by Mr. Blanford, has also found its

* Complete Writings of Rafinesque. Binney & Tryon's Edition. New York, 1863.

way here. We suppose Mr. Blanford would call this last a variety, only, of *U. crispatus*.

It seems scarcely necessary to reply to Mr. Blanford's criticisms of *Monocondylaea crebristriata*, *M. Peguensis*, *Melania gloriosa*, or of the genus *Trigonodon* (all published in the first volume of this Journal), because he acknowledges that he has not seen the descriptions, figures or shells, and asserts that he cannot distinguish satisfactorily *Margaritana* and *Monocondylaea* from *Anodonta*, and even insists that among fresh water shells forms pass into one another to such an extent that species in the ordinary acceptance of the term have no existence. Under these circumstances we congratulate Mr. Blanford upon the reticence which caused him to refrain from publishing the "20 or 30 forms of *Unio* and nearly as many more of *Melania*, with as good claims to distinction as one-half at least of those already published from India and Burma."

FRENCH.

Journal de Conchyliologie. Third Series. Vol. VII, No. 1. Paris, January, 1867.

The present number contains 100 pages and two plates. Its contents are—

Catalogue des Nudibranches et Céphalopodes des côtes océaniques de la France. By P. FISCHER.

Doris derelicta is proposed and described as a new species. It is stated to be possibly the *D. verrucosa* of Philippi and of Verany, but not the species described under the latter name by Cuvier.

Note sur l'animal de l'Helix constricta, Boubée. By J. B. GASSIES.

Observations sur la nomenclature de quelques espèces de la Nouvelle-Calédonie. By E. MARIE.

The following changes are made in names of species:—

Helix Lombardoï, Montrouzier, should be *H. Lombardeauï*.

" *Seisseti*, " " *Saisseti*.

" *Lifuana*, " " *Lifouana*.

Faunule malacologique de la vallée de Baréges (Hautes-Pyrénées. By O. DEBEAUX.

Descriptions de deux nouvelles espèces de Streptaxis. By Dr. LOUIS PFEIFFER.

S. Crossei, Coreobado, near Rio Janeiro, Brazil.

" *Paivana*, Macahe, Brazil.

Descriptions d'espèces nouvelles de Cecidæ. By L. de FOLIN.

<i>C. phronimum</i> ,	Port-au-Prince, Haiti.
" <i>ryssotitum</i> ,	Antilles, Venezuela, Brazil.
" <i>irregulare</i> ,	Bahia, Brazil.
" <i>paradoxum</i> ,	Pearl Isles, Bay of Panama.
" <i>uncinatum</i> ,	" "
" <i>coronatum</i> ,	Jamaica.
" <i>insigne</i> ,	"
" <i>breve</i> ,	"
" <i>clava</i> ,	Guadeloupe.
" <i>mirificum</i> ,	San Miguel, Pacific Ocean.
<i>Brochina Someri</i> ,	Pernambuco, Brazil.
" <i>achirona</i> ,	Bahia, Brazil.

Description d'un Helix de la Nouvelle-Calédonie. By H. CROSSE and E. MARIE.

H. Vieillardii.

Diagnoses d'espèces inédites de la Nouvelle-Calédonie. By J. B. GASSIES.

<i>Helix opaoana.</i>	<i>Melampus sordidus.</i>
<i>Melampus morosus.</i>	" <i>cassidulus.</i>
" <i>cinereus.</i>	<i>Hydrocena pygmaea.</i>

Descriptions d'espèces nouvelles. By H. CROSSE.

<i>Cassis Coronadoi</i> ,	Crosse,	Matanzas, Cuba.
<i>Conus Blanfordianus</i> ,	"	Hab.—?

Descriptions d'espèces nouvelles de coquilles terrestres et fluviatiles Américaines. By Dr. A. BROT.

<i>Lythoglyphus tricoatus</i> ,	Uruguay.
" <i>conicus</i> ,	"
<i>Vitrina Sumichrasti</i> ,	Mexico.

Description d'espèces terrestres nouvelles de la République de l'Equateur. By J. GONZALES HIDALGO.

Helix Amori. *Bulimus Junguarinoi.*

Description d'un genre nouveau de la famille des Fissurellide. By H. CROSSE.

Genus *Semperia*; type *S. Pairana*, Crosse, Madeira.

Bibliographie. Necrologie. Nouvelles.

Under the latter heading it is mentioned that marine aquaria have been established at Arcachon (Gironde) and Boulogne, in

France, and stocked with interesting and rare mollusks, such as *Octopus*, *Loligo*, *Sepia*, *Doris*, *Eolis*, *Aplysia*, and various uni-valve and bivalve shells, so that the habits of these creatures may be observed with facility. We highly commend these undertakings, and hope they will be imitated on this side of the Atlantic.

The discovery of Mr. W. T. Blandford of an operculum in a second species of his genus *Opisthostoma*, places that genus in the family *Diplommatinacea*. The first species of *Diplommatina* discovered in New Caledonia has just been communicated to M. Crosse by Mr. E. Marie; it will be described under the name of *D. Mariei*.

Revue et Magasin de Zoologie. 1866. No. 11. By GUERIN-MENEVILLE.

List des Mollusques Ptéropodes observés sur les côtes du Maroc, de l'Algérie et de la Tunisie. Par MM. le docteur FRÉDÉRIC MERCIER et HENRI AUCAPITAINE.

Revue et Magasin de Zoologie. Par GUERIN-MÉNEVILLE. 1867. No 2.

Nouvelles Miscellanées Malacologiques. By Dr. PALADILHE, of Montpellier.

III. *Le genre Assiminea, en France.*

A. gallica, Paladilhe.

IV. *Espèces inédites, nouvelles ou peu connues, du département de l'Hérault.*

Hydrobia entrepha.

Valvata planorbulina.

" *Mabilliana.*

" *exilis.*

Paludithia conica.

Archives Malacologiques. Par M. JULES MABILE.

I. *Le genre Geomalucus, en France.*

G. Andrewsii.

G. Paladilhianus.

" *Bourguignati.*

" *Moitessierianus.*

GERMAN.

Württembergische naturwissenschaftliche Jahreshefte 21st Year. Parts 2 and 3. 8vo. Stuttgart, 1865.

Ueber die Molluskenfauna Württembergs. By EDWARD VON MARTENS.

Containing full particulars of localities and geological duration of the species.

Die Bänder der Hain und Gartenschnecke. By Dr. GEORGE MARTENS.

Malakozoologische Blätter. Conducted by Dr. LOUIS PFEIFFER. Vol. 13. 7—9th Sheets. Sept., 1866.

Ueber einige Africanische Binnenconchylien. By ED. VON MARTENS.

<i>Paludina Abyssinica,</i>	Abyssinia.
<i>Physa (Physopsis) Abyssinica,</i>	"
<i>Unio Abyssinicus,</i>	"
<i>Pupa (Ennea) infrendens,</i>	Natal.

Anatomie von Amphibola nux-avellana, Gmel. By Dr. LEHMANN, of Stettin.

Eine neue Nanina aus West Africa. By H. DOHRN.

Nanina Thomensis, Isl'd St. Thomas.

Beschreibung einer neuen Helix. By Dr. L. PFEIFFER.

Helix macroglossa, Great Inagua, Bahamas.

Die Binnenconchylien von Ilha do Principe. By Dr. H DOHRN.

Vibrina dumeticola.

Stenogyra (Subulina) angustior.

Nanina aglypta.

Streptostele Moreletiana.

Buliminus (Rhachis) Burnayi. *Truncatella princeps.*

Stenogyra (Opeas) pauper. *Neritina Manoeli.*

Streptostele, n. gen.*

Miscellanies. By H. DOHRN. *On Helix Monrovia, Rang., with Remarks by L. PFEIFFER.*

Beschreibung einiger neuer Landschnecken von Cuba. By Dr. L. PFEIFFER.

Oleacina incerta, Reeve. *Oleacina teres*, Pfr.

" *Gundlachi*, Pfr. *Spiraxis Moreletiana*, Pfr.

" *Poeyana*, " *Succinea Arangoi*, "

" *Wrighti*, "

Ueber Limnaeus papyraceus und Ampullaria rosea Spix.
By Dr. KRIECHBAUMER, of Munich.

Ueber die Auriculaceen der Madera-Gruppe. By Dr. L. PFEIFFER.

* Allied to *Ennea* and *Streptaxis*. Their differences are expressed in three words: *Streptaxis* is helicoid, *Ennea* pupoid, and *Streptostele* achatinoid.

Novitates Conchologicæ. Parts 24, 25. Edited by Dr. LOUIS PFEIFFER. 4to. Cassel, 1866. (With six colored plates.)

This issue completes the second volume of the series of the Novitates devoted to terrestrial shells. It contains a monograph of the genus *Lanistes*, by Dr. E. von Martens, including the following new species:—

L. ellipticus, Martens, Mozambique.

Full descriptions and figures of a number of species of *Helicidæ*, the original diagnoses of which have been published recently in the London Zool. Proceedings, and Malakozoologische Blätter.

Novitates Conchologicæ Supplement III. Monographie der Molluskengattung *Venus*. Parts 5, 6. By Dr. EDWARD RÖMER. 4to. Cassel, 1866. (With six colored plates.)

The present Parts are devoted to species of *Callista*, Poli. The following is new:—

C. guttata, Römer, Hab.—?

It is a mistake to quote amongst the localities of *C. gigantea*, Chemn., New Jersey and Maryland; it has never been found nearly so far north.

ITALIAN.

Catalogue of the Collection of Shells, classified according to the Lamarckian System, belonging to Jean Rigacci. Part I, Recent Mollusca. 8vo. Rome, 1866.

This Catalogue contains the names and localities of 5167 species. It is published for the purpose of making exchanges.

NORWEGIAN.

Forhandlinger i Videnskabs-Selskabet i Christiania, Aar, 1864. 8vo. Christiania (Norway), 1865.

Malakozoologiske Jagttagelser. By M. SARS.

I. *On Dyret at Cryptodon Sarsii (Axinus) Philippi.*

With full anatomy of the species illustrated by two plates.

II. *Nye Arter af Slægten Siphonodentalium.*

S. Lofotense, Sars.

S. subfusiforme, Sars.

“ *affine*, “

“ *pentagonum*, “

With illustration of the shells and anatomy.

SCIENTIFIC INTELLIGENCE.

NEW LOCALITY FOR *GLANDINA TRUNCATA*.—This species has been detected living at Macon, Georgia, where Mr. T. C. Downie, of that city, assures the Editor that he has collected it. Further observation of the habits of this species is promised by Mr. D. during the coming collecting season. Its occurrence so far from the coast is a very curious discovery.

SHELL-COLLECTING IN BRAZIL.—Mr. A. D. Brown, a zealous conchologist residing at Princeton, N. J., has just departed for Brazil, where he proposes to spend a year in collecting shells in the interior provinces of Goyaz and Matto Grosso, which have never before been conchologically explored.

Helicina circumlineata, Tryon, published in this Journal, ii., p. 305, t. 20, f. 13, is a species of *Trochatella*.

The Collections of the late Dr. Gould have not become the property of the Boston Society of Natural History, as stated p. 107. They have been placed in the Geological Rooms at Albany, N. Y. The price paid for them was \$6000.

1

BY-LAWS
ESTABLISHED FOR THE GOVERNMENT
OF THE
CONCHOLOGICAL SECTION
OF THE

Academy of Natural Sciences of Philadelphia.

CHAPTER I.

ART. I. The exclusive purposes of the society, instituted under the name of the Conchological Section of the Academy of Natural Sciences of Philadelphia, shall be the cultivation and study of Conchology (recent and fossil) by the publication of discoveries, by collecting a cabinet of specimens, a library, &c., by extending and utilizing a knowledge of the science, through the agency of popular lectures.

ART. II. The Section shall consist of members and correspondents.

ART. III. The right of voting, of holding office, and of transacting business belongs to members only; correspondents are entitled to all other privileges of membership.

ART. IV. The seal of the Section shall be the name of the association, surrounding the words,

Instituted December 26th, 1866.

ART. V. The Section shall grant to each member and correspondent a certificate, as follows :

The Conchological Section of the Academy of Natural Sciences of Philadelphia has elected ——— ———, this ——— day of

Secretary.
Recorder.

[L. s.]

Dirac or.
Vice-Director.

and upon payment of a diploma fee of five dollars, a handsomely engraved diploma shall be furnished in lieu thereof.

ART. VI. The library and museum shall be exclusively for reference; *all donations made to either are regarded to have been presented on condition that they shall not be loaned for any purpose, unless otherwise directed by the donor*; but books may be presented to the library, reserving to the donor only, the right to borrow them.

ART. VII. The officers of the Section shall be a Director, a Vice-Director, a Recorder, a Secretary, a Treasurer, and a Conservator, who shall be elected by ballot at the stated meeting in December.

CHAPTER II.

OF MEMBERS AND CORRESPONDENTS.

ART. I. No person is eligible to become a member or correspondent of this Section, unless already a member or correspondent of the Academy of Natural Sciences.

ART. II. Any member or correspondent of the Academy may become a member or correspondent of the Conchological Section, either by addressing a written notice to its Director or by election.

ART. III. Every candidate for admission into the Section by election shall be nominated in writing at any meeting, by at least two members of the Section, who shall record his name and place of residence appropriately, and he shall be balloted for at any one of the three meetings next subsequent, but after that time the nomination shall be considered void.

ART. IV. No member shall be entitled to the privileges of membership until he shall have paid to the Treasurer or Recorder the fee of initiation, and signed the following obligation:

In becoming a member of the Conchological Section of the Academy of Natural Sciences of Philadelphia, I promise to conform myself to its laws and regulations, and in testimony thereof I hereunto subscribe my name.

ART. V. If any member shall not sign the above declaration, and pay the fee of initiation within six months after the date of his admission; or when any member shall neglect to pay his

semi-annual contributions, unless satisfactory reasons be assigned for non-payment, the treasurer shall report the case at a meeting for business, and, if a majority of the members present concur, his membership shall be considered forfeited.

ART. VI. If any person shall be balloted for and rejected, or his name be withdrawn previous to ballot, no note of said rejection or withdrawal shall be made on the minutes of the Section.

ART. VII. No candidate thus rejected shall be proposed again before the expiration of one year; nor shall any one whose name has been withdrawn previous to ballot, be proposed again until the expiration of six months after the date of said withdrawal.

ART. VIII. Any member shall have leave to resign upon written application therefor, accompanied by a certificate from the treasurer that all arrears due from him to the Section have been discharged.

ART. IX. Any member may be expelled from the Section for any flagrant act of disrespect to the officers or members of the Section, or wilful violation of its laws or rules, or for dishonorable conduct.

ART. X. A motion to expel must be accompanied by a charge or charges and specifications signed by at least two members; and on the adoption of such motion, the Secretary shall, without delay, notify the member that a proposition to expel him will be considered at the next meeting of the Section.

ART. XI. No member shall be expelled unless three-fourths of the members present agree thereto, provided that at least six members vote, and then not without having an opportunity afforded him to defend himself.

ART. XII. No person thus expelled shall be eligible for membership under any circumstances.

ART. XIII. No person residing in Philadelphia, or within a circuit of thirty miles around it, unless he be an officer of the army or navy, shall be elected a correspondent; nor shall any correspondent continue to be such after he shall have become permanently domiciled within the said circuit. But any correspondent may become a member without an election, provided

that, within six months after removing within said circuit, he shall pay the fee of initiation and sign the same obligation, (Art IV, Chap. II,) as a member.

ART. XIV. Correspondents may be chosen without limit as to number, but it is recommended that their qualifications shall in all cases be either great scientific attainments, or the special benefits which they may have conferred by the donation of money, books or specimens of value. The first class shall be designated "Scientific Correspondents," the latter "Contributing Correspondents." From the first class, the Section may yearly select not exceeding five persons, who shall be elected "Honorary Scientific Correspondents." The total number of these shall not exceed twenty five, and after attaining that number, only vacancies caused by death shall be filled by election.

CHAPTER III.

OF OFFICERS AND THEIR DUTIES.

ART. I. The Director shall preside at the meetings of the Section, preserve good order and decorum, regulate debates, nominate the chairman of all committees, other than those especially excepted, and call special meetings of the Section at such times as he shall deem necessary; and, also, on a written request of five members.

ART. II. In the absence of the Director, the Vice-Director is charged with the performance of his duties.

ART. III. The Recorder shall note and correctly record the transactions of the Section during its meetings, and prepare abstracts of the same for insertion in the authorized publication of the Section; inform members of their election, and notify members of their appointment on committees; keep a correct list of the members of the Section, with their places of residence, date of admission, resignation or death, and give timely notice of each to the Treasurer; report to the Section the name of every member, who may have failed to comply with (Art. IV, Chap. II, of) these by-laws. He shall have charge of the seal of the Section; and, at the meeting in December, he shall submit a written report of the transactions of the Section during the year. He shall give every member, on paying the

fee of initiation, and signing the obligation required (Art. IV, Chap. II), a copy of the by-laws.

ART. IV. The Secretary shall conduct the correspondence and preserve correct copies of all letters written on the business of the Section; acknowledge the receipt of all donations from persons who are not members of the Section, and keep a correct list of the correspondents, with the dates of their admission, resignation or death, and their postal address or residence. He shall have charge of the certificates of membership, and cause one to be properly filled up, signed, sealed and delivered to every member qualified to receive it, and forward to every correspondent, a copy of the by-laws, at the time he shall notify him of his election, or as soon afterwards as practicable. He shall make a statement of his transactions at every meeting, and shall, at least once in three months, report to the Academy of Natural Sciences the proceedings of the Conchological Section.

ART. V. The Treasurer shall have charge of the funds of the Section, and keep a clear and detailed statement of all receipts and expenditures, which, with the names of those members who are in arrears, he shall lay before the Section at the stated meeting in December. He shall collect and pay monies; but he shall pay no money except on an order of the Section, vouched for by the signature of the Director, (or, in his absence, of the Vice-Director), and the Recorder.

ART. VI. The Conservator shall have charge of the special collections of the Section. He shall purchase all articles required, if instructed by the Section, report when repairs of any kind are needed, and when ordered, see that they are properly executed. He shall report all additions to the museum at each meeting and its condition at the stated meeting in December. He shall be employed continually in preparing, labelling and arranging specimens in the museum, and in making exchanges, under the direction of the standing committees of the museum; and he shall also perform such other duties as may be assigned to him from time to time by vote of the Section.

To compensate the Conservator, he shall receive a salary in quarterly payments, the amount of which shall be fixed annually by the Section at its stated meeting in December.

CHAPTER IV.

OF SPECIAL FUNDS.

ART. I. The Conchological Section hereby creates separate funds for the following specific purposes: The Conservator's Fund, the Museum Fund, the Library Fund, and the Publication Fund. The principal of each fund shall be kept invested in the name of the Section always in good lawful securities—the loans of the United States, of the State of Pennsylvania, or of the city of Philadelphia, or such sound real estate securities as the Section may direct, and shall be held by the Section in trust for the special purposes for which each fund may be created.

ART. II. All money which may accrue in the process of changing the investment of a trust fund shall be invested again without delay for the same trust, but no investment shall be changed without the consent of the Section.

ART. III. The Treasurer shall open and keep in the appropriate books of the Section a separate and distinct account of each fund which may be created, and record all payments and contributions or donations made to it, as well as all expenditures of interest money authorized on its account, and report the condition of each annually.

CHAPTER V.

THE CONSERVATOR'S FUND.

ART. I. The Section has created a permanent fund called the Conservator's Fund, of which the ultimate amount shall not exceed \$30,000, and the interest of which is to be used in compensating its Conservator.

ART. II. All monies realized by lectures, drawings, or duties performed by the Conservator, as well as the receipts from diplomas of membership and all life memberships, shall be invested in this fund.

ART. III. Any person who shall contribute \$50 or upwards to this fund, shall receive the following certificate.

A. B., has contributed dollars to the Conservator's Fund of the Conchological Section of the Academy of Natural

Sciences of Philadelphia, in consideration of which he or any person to whom he may assign or bequeath this certificate, or who may inherit it, is hereby entitled to free admission to all public lectures which may be delivered under the direction or authority of the Section from [insert date].

This certificate is transferrable through the office of the treasurer of the Section by bequest or otherwise.

—*Treasurer.*

—*Director.*

[seal]

On the reverse of this certificate Chapter IV of these by-laws shall be printed.

CHAPTER VI.

OF THE PUBLICATION FUND.

ART. I. The Section has created a permanent fund, called the Publication Fund, (the principal of which should amount to \$20,000), and the interest accruing therefrom shall be appropriated exclusively to the payment of the expenses of printing and publishing such matters, stated or occasional, as the section may direct or authorize to be issued.

ART. II. Any person shall be entitled to receive a copy of every issue of the "American Journal of Conchology" during life, on the payment of such sum as the Section may fix from time to time, provided that the sum shall never be less than one hundred dollars.

ART. III. To each person whose contribution to the publication fund entitles him to receive a copy of the "Journal," a certificate shall be issued as follows:

———, has contributed to the publication fund _____ dollars, and therefor is entitled to receive, free of cost during life, one copy of the "American Journal of Conchology."

—*Director.*

—*Treasurer.*

[seal]

On the reverse or back of the above certificate this chapter and also chapter IV of the by-laws shall be printed.

CHAPTER VII.

OF THE LIBRARY FUND.

ART. I. The proceeds of the sales of duplicate works belonging to the Section shall be invested in a fund, the interest of which shall be expended exclusively in additions to the library of conchological works and to binding the same.

ART. II. Separate account shall be kept of the donations of each person to the library, which may be thus sold, and works purchased with the interest of the proceeds of such sales, shall be regarded as presented by him.

ART. III. Persons who contribute a sum of money to this fund, shall receive the following certificate :

———, has contributed to the Library Fund of the Conchological Section of the Academy of Natural Sciences, dollars, the interest of which is to be expended only in the purchase of books, which shall be labelled as presented by him to the library. During his life these purchases shall consist of such books as he shall designate.

—*Director.*

—*Treasurer.*

[seal]

ART. IV. Any person who shall contribute money to be expended at once for the purchase of specified works on Conchology, shall be entitled to borrow such works from the library at pleasure, upon giving the Library Committee an acknowledgment therefor.

CHAPTER VIII.

OF THE MUSEUM FUND.

ART. I. The interest arising from this fund shall be expended in purchasing specimens which cannot be obtained by exchange or donation; and proceeds of the sales of duplicate specimens, shall be thus invested.

ART. II. To contributors to the above fund the following certificate shall be given :

———, has contributed ——— dollars to the Museum Fund of the Conchological Section of the Academy of Natural Sciences. He has the privilege of designating the specimens

which shall be purchased with the accruing interest of the above sum, and is entitled to select such specimens as he may desire from among those offered for sale by the Section, to an amount not exceeding one fourth of the above sum annually, upon paying for them one half the affixed price of specimens.

—*Director.*

—*Treasurer.*

[seal]

ART. III. In addition to the above, temporary funds may be established from time to time for specific explorations and collections. Of the results of these, the first series will be retained for the museum, and when numerous, a few series will be sold for its benefit, while the balance, properly labelled, will be divided *pro-rata* among the subscribers.

CHAPTER IX.

FEES, CONTRIBUTIONS, ETC., PAYABLE BY MEMBERS.

ART. I. Every member elect shall pay to the Treasurer an initiation fee of two dollars, prior to signing the obligation.

ART. II. Every member shall be subject to a semi-annual contribution of one dollar, payable at the stated meetings in June and December.

ART. III. But any member who shall pay to the Treasurer twenty-five dollars, shall be exempt from all future semi-annual contributions.

ART. IV. The Treasurer, with the sanction of the auditors, shall be authorized to exempt any member, on his application, from the payment of such semi-annual contributions as may become due from him, while absent from the district including Philadelphia, and thirty miles around it, during any period of not less than six months. But no member who at the time of his admission is domiciled beyond the limits of said district, shall be exempt from the payment of semi-annual contributions.

ART. V. No pecuniary contributions shall be required from correspondents.

ART. VI. But no engraved diploma of membership shall be issued to either members or correspondents, except upon payment of a diploma fee of five dollars.

CHAPTER X.

OF THE MUSEUM.

ART. I. No specimen in charge of the Conchological Section of the Academy shall be loaned from the hall under any pretence whatever, and all specimens presented to the Academy by or through this Section are given strictly upon this condition, unless otherwise stipulated by the donor. This restriction shall not apply to unarranged duplicates.

ART. II. The keys of the cases containing the collections in charge of the Section shall be kept by the Conservator and the members of the standing committees; they only have authority to open the cases, and they are responsible for all articles confided to their care.

ART. III. If any member desires to inspect very closely any specimen in the collection for the purpose of study or description, he can do so on application to the Conservator or members of the committee having it in charge.

ART. IV. All articles in the collection must be properly labelled as far as practicable. And the Conservator shall make and publish an accurate and minute catalogue, naming every specimen confided to his care.

ART. V. Specimens or articles presented to the collection shall be properly labelled and placed therein before the stated meeting next succeeding the date of presentation, if possible.

ART. VI. Collections bequeathed or given on condition that they are not to be broken or distributed or the labels altered, if accepted, may be kept in separate cases or in separate apartments, and shall be designated and known by the name of the donor or testator, or as he or she may direct; and when accompanied by an endowment of a special curatorship it also shall be officially designated by the same name as the collection to which it may pertain.

ART. VII. The Conservator shall dispose of duplicate specimens by exchange or sale, only when authorized by a vote of the Section; but no specimen belonging to any collection specially accepted by the Section under the provisions of the preceding

Article shall be regarded as a duplicate, although previously in the collection, unless so directed by the donor or testator.

ART. VIII. It shall be the duty of the Conservator and of the committees having charge of the collection, to report to the Section at every meeting all newly published species, in order that measures may be taken to procure them.

CHAPTER XI.

COMMITTEES AND THEIR DUTIES.

ART. I. There shall be a standing committee of three members on each subject herein named, as follows ;

- | | |
|---|----------------------------|
| 1. On Embryology and Anatomy. | 6. On Fluvialile Acephala. |
| 2. " Cephalopoda, Pteropoda
and Brachiopoda. | 7. " Marine Gasteropoda. |
| 3. " Terrestrial Mollusca—non-
operculate. | 8. " " Acephala. |
| 4. " Terrestrial Mollusca—oper-
culate. | 9. " Palæontology. |
| 5. " Fluvialile Gasteropoda. | 10. " Lectures and Prizes. |
| | 11. " The Library. |
| | 12. " Publication. |
| | 13. " Finance. |

ART. II. All standing committees shall be elected at the stated meeting in December, and in the same manner as officers.

ART. III. In appointing all other committees, unless otherwise ordered by the meeting, the Director is to nominate the first member of it as chairman, who is to nominate a second, the second a third, and in like manner successively, until the number agreed on be completed.

ART. IV. The final reports of all committees must be in writing ; and every report must be signed by a majority of the committee offering it ; but partial reports or reports of progress may be verbal.

ART. V. All special committees shall report at the meeting of business next succeeding their appointment, unless otherwise directed by the Section.

ART. VI. The members of the committee of finance in conjunction with the Treasurer have the superintendence of the funds of the Section ; they shall audit accounts, examine all bills and report upon them ; examine the treasurer's books and accounts and report their condition at the stated meeting in

January, stating the number of members who have failed to pay their semi-annual contributions.

ART. VII. The committee on publications shall conduct the printing and publishing of the "Journal," etc., under the rules of the Section and report at the stated meeting in December.

ART. VIII. The committee on the library, the chairman of which shall act as Librarian, shall have supervision of the books which belong to the Conchological Library, of which it shall prepare and publish a catalogue. It shall report to the Section at each meeting the names of all newly published works, in order that they may be obtained for the library; it shall purchase books, negotiate exchanges and sales of duplicates thereof as directed by the section; keep a correct record of all their transactions, and report at the stated meeting in December.

ART IX. The standing committees, numbered from one to nine inclusive, in Article I, Chapter XI, in conjunction with the conservator, have charge of the collections in their respective departments. They shall cause to be arranged, labelled and kept in order all articles presented and deposited, make and preserve accurate catalogues of them, with the name of the donor or depositor of each article, and at the stated meeting in December each committee shall report to the Section the condition of its department.

And each of the committees, from one to nine, in the order named in Art. I, of this chapter, may read at any meeting, every three months, a summary of the general progress of its department, embracing announcements of discoveries and publications. Such periscopic summaries shall be given to the committee on publication, to be printed or not, in the "Journal," entire or in part, as the committee may determine.

ART. X. The committee on lectures and prizes shall have the immediate business management of public lectures delivered under the auspices of the Section, and provide a verbal communication for each meeting, to be announced when practicable at the preceding meeting. They shall also report the names and claims of persons entitled, in their opinion, to receive the prize medals of the Section, and present the same upon their adjudication. They shall also propose subjects for competition for prizes, and

upon a selection being made by the Section shall properly advertise the same.

ART. XI. Each standing committee shall meet at least quarterly. The place of any member who is absent from his committee during six months may be considered vacant, and filled by the Section till the next regular election.

CHAPTER XII.

COMMITTEE ON PUBLICATIONS.

ART. I. Immediately after its election the committee on publications shall appoint from its members a Secretary, a Distributor and Treasurer, and keep correct minutes of the financial and other concerns of the "Journal," and other printing.

1. The Secretary shall be the editor of all matter referred to the committee to be published or printed.

2. The Distributor shall be charged with the prompt distribution and transmission of all issues by the committee to subscribers, as well as to societies, individuals, and periodicals with which exchanges are authorized, and also for a correct and separate record of the distribution of each of the Section's publications.

3. The Treasurer shall have charge of the finances of the committee. He shall keep a correct account of all receipts and expenditures, in connection with each publication, separately; and he shall report at the meeting in December the number of each publication printed, the number distributed to subscribers, and the number exchanged, with the aggregate of each remaining, together with a statement of his accounts for the year, which shall be referred to the finance committee for examination.

ART. II. The committee shall receive and cause to be published as early as possible all papers ordered for publication by the Section and print them, as far as practicable, in the order in which they have been referred. And it shall also print abstracts from the minutes of the meetings of the Section, and summaries of verbal communications made, but only from notes furnished by their authors, which the committee may modify or decline, subject, however, to an appeal to the Section.

ART. III. No author shall be permitted to make other than verbal alterations in his paper while it is in the hands of the publication committee without the consent of the Section; nor is the publication committee authorized to make any alteration in any paper committed to it without the consent of its author. All alterations proposed to be made (other than verbal) must be submitted to the special committee which recommended its publication.

ART. IV. Drawings shall be considered the property of him who furnishes them, and shall be returned on demand.

ART. V. It is a duty of the committee to read the proof-sheets of all papers, and, when practicable, they shall be submitted for correction to the author also.

ART. VI. Descriptions of new species shall always be illustrated by figures, and when of recent species they shall be colored; and in all other cases where illustrations will add to the value of an essay, they shall be furnished at the cost of the Section.

ART. VII. Every author is entitled to receive one copy of the number or numbers of the issue in which his paper appears, and, on timely application to the committee, twenty extra copies of his paper, without re-arranging, re-paging, or illustrations, at the cost of the Section. But he may obtain any additional number of copies arranged as he may desire, with or without illustrations, at his own expense, on such terms as may be determined upon and advertised by the committee.

ART. VIII. The committee on publications is hereby authorized to fix from time to time, with the concurrence of the Section, the prices at which its publications shall be sold to members, correspondents and others; and also to exchange its publications for any work which it may estimate to be of sufficient value, provided that the Section may at any time direct the discontinuance of such exchange.

ART. IX. The committee shall be responsible for the proper arrangement of the matter of all publications and for the prompt issue of the "Journal" whenever there is enough to complete thirty-two pages; and if, in the opinion of two-thirds of the members present at the meeting next succeeding the publication, any

portion of it has been negligently prepared, the same shall be reprinted at the cost of the committee.

ART. X. The actual date of publication of any issue of the "Journal," shall be determined by the published record of its presentation at a meeting of the Section.

ART. XI. No alteration in the quality of the paper, type, or other details of mechanical execution of the "Journal," shall be made without the consent of the Section.

ART. XII. The price of the "Journal" is directed to be for the present eight dollars per annum to members subscribing and paying in advance, as well as to booksellers—and ten dollars to others, as well as for completed volumes in all cases.

ART. XIII. The Academy of Natural Sciences shall be furnished with as many copies of the "Journal" as it may require for its exchanges, upon paying proportionate share of cost of publication.

CHAPTER XIII.

COMMUNICATIONS, &C.

ART. I. Every written communication read before the Section, and intended for publication, shall be referred to a special committee, which shall report thereon at the meeting next after its appointment [unless otherwise ordered by the Section.]

ART. II. Every such communication becomes the property of the Section.

ART. III. But all written communications which shall not be accepted for publication, or not published within a reasonable time, shall be returned to their authors when requested.

CHAPTER XIV.

OF PRIZE MEDALS.

ART. I. The Conchological Section of the Academy of Natural Sciences of Philadelphia, founds the following prizes, to be awarded to distinguished talent in the cultivation of the science of conchology, and to commemorate remarkable discoveries or laborious original researches.

ART. II. These prize-medals shall be one of bronze, another of silver, and a third of gold.

ART. III. The bronze medal shall be annually awarded by the Section to any person whom it may consider entitled to the honor.

ART. IV. The silver medal shall be presented annually to the person who shall submit for that purpose the best essay for publication in the "Journal." The Section reserves to itself the right to designate, upon the recommendation of the committee, on lectures and prizes, the subject of competition for this prize.

ART. V. The gold medal shall be awarded once in five years upon the decision of a special committee, which shall take into consideration the merits of persons to be nominated by each scientific standing committee. It is not necessary that the recipient of this prize shall be an American citizen, or that his paper shall be published in the first instance in the "Journal" of this Section; it is intended to reward, by this recognition, the highest merit, wherever found.

CHAPTER XV.

MEETINGS.

ART. I. The stated meetings of the Section shall be held on the first Thursday evening of each month, at eight o'clock.

ART. II. Special meetings may be convened by resolution of the Section, or by public notice from the Director, or at the written request of five members.

ART. III. Three members shall constitute a quorum.

ART. IV. Strangers may be introduced at meetings of the Section.

ART. V. The order of business at meetings shall be :

1. Minutes of the last meeting shall be read.
2. Donations to the museum read, and report of new species wanted for the museum, and action thereon.
3. Donations to the library read, and report on new books wanted for the library, and action thereon.
4. Written communications to be made.
 1. Correspondence.
 2. Papers read and referred to committees.

PROSPECTUS
OF A
CATALOGUE AND SYNONYMY
OF ALL THE
GENERA, SPECIES AND VARIETIES
OF
RECENT MOLLUSCA,
Described prior to January 1st, 1867.

Compiled and published under the authority of the Conchological Section
of the Academy of Natural Sciences of Philadelphia.

In the year 1845 Miss Agnes Catlow, assisted by Lovell Reeve, published a volume entitled "The Conchologist's Nomenclator: a Catalogue of all the recent Species of Shells." This work, although necessarily, as a first attempt, very imperfect, proved extremely useful, not only as an index to the volumes containing the original descriptions and figures, but also as a catalogue for private collections, for conducting exchanges, etc. Some of the copies of this work were printed on one side of the leaf only, so that they could be cut into labels. The only extensive general catalogue of species which has appeared since the publication of Miss Catlow's work is that of Dr. Jay's collection of shells, fourth edition, 1850. Like the former, it contains about ten thousand specific names, but it gives the synonymy at greater length, besides localities. Both these works are based on the Lamarekian system.

Many smaller catalogues of private collections have since been published, as well as monographs of particular families and genera, including among the latter Pfeiffer's "Terrestrial Mollusea," Kiener's "Monographie des Coquilles Vivants," Chenu's "Illustrations Conchyliologiques," Küster's "Conchylien Cabinet von Martini and Chemnitz, continued," Reeve's great work, the "Conchologia Iconica," Sowerby's "Concho-

logical Illustrations" and "Thesaurus Conchyliorum," Hanley's "Descriptive Catalogue of Recent Bivalve Mollusca;" and the pages of the various Natural History Journals and Transactions of learned societies contain very many papers of like character and of great importance, such as Lea's "Synopsis of Naiades," Frauenfeld's "Monography of Paludina," Mohrenstern's "Monograph of Rissoidæ," Tryon's "Monography of the Order Pholadacea," and "Synonymy of Strepomatidæ." There are, besides, hundreds of smaller papers describing species and genera, particularly in the "Proceedings" of the Zoological Society of London, the "Proceedings" and "Journal" of the Academy of Natural Sciences of Philadelphia, and in the three periodical works exclusively devoted to the advancement of Conchology,—the "Malakozoologische Blätter," the "Journal de Conchyliologie," and the "American Journal of Conchology."

Through the above and other publications, the ten thousand species known to conchologists in 1845 have been increased to over twenty-five thousand, and a much better knowledge of the genera and higher groups has also been attained. It is therefore evident that the publication at the present time of a complete Catalogue of Recent Mollusca, and their synonymy, based on the critical study of actual specimens, as well as of descriptions and figures, would be exceedingly useful as a directory for the use of students in this science.

The Conchological Section of the Academy of Natural Sciences of Philadelphia, having nearly twenty thousand well authenticated species under its charge, with access to the many splendid collections belonging to its members, and possessing a library containing nearly every book or pamphlet ever published on the subject of Conchology, has peculiar facilities for publishing such a Catalogue. It proposes to avail itself freely of all Catalogues and Monographs heretofore published, giving in such cases full credit to their respective authors, and adding all additional species described to the close of the year 1866. A supplement may be issued in 1875, and thereafter every five or ten years, as the number of described species may require it. The work of compilation will be intrusted, as far as practicable, to those who have made a special study of their respective subjects; and families or genera will be published as fast as completed, without following any systematic order: the work to include an index to the genera when completed.

Gentlemen who are willing to assist in the preparation of this great work are requested to make known their wishes as early as possible.

The arrangement of the work will be as follows:

The families, genera, and sub-genera will be printed in large, heavy-faced type, with references to authorities and dates in smaller type: the synonyms in italics.

The specific names (in heavy-faced type) will be arranged alphabetically, preceded by numbers, and followed by authorities and references to the original descriptions. It is intended to include among the references to each species, the monographs in which it is figured.

The principal synonyms will be printed in italics, with full bibliography. Finally, the localities will be given.

The following example will give a better idea of the plan of the work than can be conveyed by description.

GENUS **BRECHITES**, Guettard.

Mem. de l'Academie, Paris, ii. 18, 1774.

Aspergillum, Bruguiere, Encyc. Meth. Vers. 1789.

Sub-genus **WARNEA**, Gray.

London Zool. Proc. 309, 1858.

4. **B. Australis**, Chenu, Illust. Conchyl. 3, t. 3, f. 1.

Aspergillum Cumingianum, Chenu, Illust. Conchyl. 3, t. 3, f. 4.

Reeve, Conch. Icon.: Monog. *Aspergillum*, t. 2, f. 7, 1860.

Aspergillum incertum, Chenu, l. c. 4, t. 4, f. 4, 5. Reeve, l. c. t. 4, f. 19, 1860.

After printing the Catalogue, the types composing the current number, name and authority, will be taken out and inserted within stereotyped borders, for the purpose of printing, on fine heavy card-board, labels for collections, thus:—

Genus **BRECHITES**, Guettard.

Aspergillum, Bruguiere.

Brechites Australis, Chenu.

(Variety or Remarks.)

(Collector.)

4

(Locality.)

The labels will be printed on white card-board, and will be of the above appearance and size, so as to fit readily within the ordinary three-inch-wide shell trays. The number in the lower centre serves as a reference to the Catalogue, so that the bibliography, etc., can be examined instantly. The Catalogue, it is believed, will answer admirably as a check list of public or private collections, as well as for making exchanges, by simply attaching a mark to each species possessed or wanted, or, for the latter purpose, by quoting numbers from it. To the student it will serve a higher purpose, in saving the vast amount of valuable time heretofore expended in searching for descriptions, by indicating at once, not only where they are to be found, but also the entire number of species described in each genus, thus facilitating and encouraging the description of *new* species, and preventing the inadvertent re-description of species already characterized.

It is proposed to meet the *expense* of this publication by the sale of Catalogues and Labels, and it is hoped that both will be extensively adopted by collectors and museums, so as to make throughout the world *one* principal standard of nomenclature and numbering.

The entire Catalogue will be completed within about five years.

TERMS.

Subscriptions will be received at the following rates *for each 16-page form*, payable on delivery:

To one address.

	1 copy.	2 copies.	3 copies.	5 copies.
To subscribers to the whole Catalogue,25,	.20,	.18,	.15
To subscribers to any portion, such as Land Shells, Fresh-water Shells, Helix, Cypræa, or any family or genus,32,	.27,	.22,	.17

. Special and very liberal arrangements will be made with gentlemen who may require a large number of copies for their exchanges, etc.

The following estimate is probably approximately correct:

Entire Catalogue, 2500 pp., \$40. Land Shells, 1000 pp., \$20. Fresh-water Univalves, 250 pp., \$5. Fresh-water Bivalves, 150 pp., \$3. Marine Shells, 1100 pp., \$22.

L A B E L S .

	<i>To one address.</i>			
	1 copy.	2 copies.	3 copies.	5 copies.
Per 100, if the whole are sub- scribed for (generic and specific)	.50,	.45,	.40,	.35
Per 100, for separate families or genera,	.75,	.67,	.60,	.50
Per 100, for selected species, or for generic labels only,	\$1.00			
Per 100, for blank labels, for writing the names of addition- al species,	.35			

* * * It will be noticed that the above arrangement gives purchasers the advantage of selecting, besides entire suites, such additional labels as they may require; all of them at much cheaper rates than the mere blank labels would cost when printed in small quantities.

A discount of 20 per cent. will be made to members of the Conchological Section, to booksellers, and to Natural History dealers.

Address

PUBLICATION COMMITTEE,
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AMERICAN
JOURNAL OF CONCHOLOGY.
NEW SERIES.

PUBLISHED BY THE

CONCHOLOGICAL SECTION of the Academy of Natural Sciences of Philadelphia.

VOL. III.

1867.

No. 3.

Meeting, May 2d, 1867.

Nine members present.

MR. TRYON, Vice-Director, in the Chair.

Donations to the Museum and Library were announced.

The following papers were offered for publication, and referred to committees:

Catalogue of the Recent Mollusca belonging to the Order Pholadacea. By Geo. W. Tryon, Jr.

Reviews of New Works. By Geo. W. Tryon, Jr.

Descriptions of new species of Gasteropods inhabiting Polynesia. By W. Harper Pease.

Synopsis of the genera *Sycotypus*, Brown, and *Busycon*, Bolten. By T. A. Conrad.

Notes on and descriptions of Fossil Shells, and of a new genus of Mactridæ. By T. A. Conrad.

Descriptions of a new genus of Astartidæ, and of new species of Venericardia and Pecten. By T. A. Conrad.

Description of a new species of Limnea. By Prof. S. S. Haldeman.

Mr. Maetier read a Prospectus of the Catalogue of the described species of Recent Mollusca, to be published by the Conchological Section: which was ordered to be printed.

Dr. Geo. H. Horn made some remarks on the localities of shells in the Colorado Desert, and in Arizona.

It was resolved that all duplicate books belonging to the Section be sold, and the proceeds invested in the "Conservator's Fund."

It was also resolved that the thanks of this Section be tendered to Messrs. Thos. Watson & Sons, and Messrs. S. & W. Welsh, of Philadelphia, for their liberal offers to transmit packages by their respective steamship lines, free of charge.

A letter was read from G. W. Tryon, Jr., announcing that, upon certain conditions, he had deposited in the Library about one hundred bound, and sixty unbound volumes and pamphlets on Conchology, all of which were desiderata to the Library.

With this addition, the Conchological Library contains nearly every paper or book published on the subject.

Dr. E. J. Nolan, of Philadelphia, and Prof. S. F. Baird, of the Smithsonian Institution, Washington, D. C., were elected members; and Col. F. F. Cavada, U. S. Consul at Trinidad, Cuba, and J. R. Willis, D. C. L., of Halifax, N. S., were elected correspondents.

Meeting, June 6th, 1867.

Eight members present.

MR. TRYON, Vice-Director, in the Chair.

Donations to the Museum and Library were read.

A letter was read from Prof. S. S. Haldeman, of Columbia, Pa., accompanying the donation of the entire remaining copies of his "Monograph of the Limniades."

Messrs. Alpheus Hyatt, of Salem, Mass., and Alex. Winchell, of Ann Arbor, Mich., were elected correspondents.

DESCRIPTIONS OF MARINE GASTEROPODÆ, INHABITING
POLYNESIA.

BY W. HARPER PEASE.

MITRIDÆ.

MITRA ASSIMILIS, Pease.—Plate 15, fig. 1.

Description.—T. fusiformi, crassa, solida, basi subtruncata, lævigata, striis remotis, punctatis, cingulata, ad basin sulcata; spira brevis; labro crenulato; columella quadriplicata; rufo-castanea, linea unica aut fascia flavescente, infra suturam, cincta, apertura pallide purpurea.

Dimensions.—Long. 17, diam. $6\frac{1}{2}$ mill.

Shell fusiform, solid, thick, base somewhat truncate, smooth, encircled with rather distant punctured striæ; spire short; lip crenulated on its edge; columella four-plaited; reddish-chestnut, encircled with a single yellowish line or band a short distance below the sutures; aperture light purple.

Remarks.—Allied to *M. coronata*. There is not, however, the slightest evidence of crenation at the sutures, and it is found associated with the typical *coronata* at several localities. My collection comprises an extended series of the latter species, in which the variation chiefly extends to size, prominence of the crenation, and in being more or less blotched or spotted with white. They are all more or less roughened longitudinally by coarse irregular striæ.

The description in *Conchologia Iconica* should be made to conform with that of Lamarck, as regards the transverse striæ.

Genus MITROPSIS.

T. fusiformi, longitudinaliter plus minusve costata seu plicata; apertura angusta; labro dentato, superne sinuato; columella plicata, callo marginata.

MITROPSIS FUSIFORMIS, Pease.—Plate 15, fig. 2.

Description.—T. fusiformi, utrinque attenuata, nitida, spira gracilis; anfr. longitudinaliter costatis, costis subremotis, rotundatis, e suturas descendentes, anfr. ultimo gibboso, transversim tenuiter striatis; sutura sulcata; basi transversim sulcata; canali recurvo; omnino alba; columella quadriplicata.

Dimensions.—Long. 7, diam. 3 mill.

Habitat.—Paumotus.

Shell fusiform, much attenuated at both ends, white, shining, spire small, slender; whorls longitudinally ribbed; ribs rather remote, rounded, descending from the sutures, last whorl gibbous on its right side; transversely finely striate; sutures widely and deeply grooved; base grooved transversely; canal recurved; columella four-plaited.

Remarks.—We have no doubt but that the above species is a Mitrid, although its sculpture and the distinct sinus on outer lip connect it with the Pleurotomidæ. The callosity bordering the inner lip gives it a Columbelloid appearance.

TURRICULA MODESTA, Pease.—Pl. 15, fig. 6.

Description.—T. fusiformis, subharpæformis, lævis, polita, longitudinaliter plicato-costata; costis 11, superne, vix tuberculatis, interstitiis longitudinaliter, læviter striatis; spira turrita, acuta, longitudinis testæ haud æquans; anfr. supernè oblique angulatis; canali brevi, vix recurvo; columella quinque plicata; apertura intus lirata; alba, lineis tribus, rufo-fulvescentis cineta, apice purpurascete.

Dimensions.—Long. $25\frac{1}{2}$, diam. 12 mill.

Shell stoutly fusiform, somewhat harpæform in shape, smooth, shining, longitudinally plicately ribbed, ribs eleven, subtuberculate above, interstices concave, irregularly and finely striate longitudinally; spire rather less than one-half the length of the shell, turrited, acute; whorls obliquely angulated above; canal short, slightly recurved; columella five-plaited; aperture lyrate within.

Color white, encircled by three reddish-yellow lines; apex purplish-black.

MITRA FLAMMULATA, Pease.

Description.—T. solida, lævigata, nitida, ovato-fusiformi, utrinque vix attenuata, transversim subtilissime striata, basi sulcata, apice acuta, tenuiter longitudinaliter costata; anfr. 9,

convexis, contiguïs, vix tumida; columella prominenter quadruplicata; labro sulcato; basi producta vix contracta, contorto-recurva; apertura recta, subangustata, longitudinis testæ dimidiam æquans; albida flammis flexuosis rufescente fuscis picta, apertura alba.

Dimensions.—Long. 25, diam. 10 mill.

Habitat.—Sandwich and Paumotus.

Shell solid, smooth, shining, ovately-fusiform, somewhat attenuated at both ends, finely striated transversely, grooved at base; apex acute and finely ribbed longitudinally; whorls 9, convex, contiguous, somewhat swollen; columella prominently four-plaited, with a slight callosity at top; outer lip regularly grooved within its whole length; base slightly produced, somewhat contracted, and recurved in a twisted manner; aperture straight, rather narrow, one-half the length of the shell; whitish, longitudinally painted, with broad, somewhat flexuous, reddish-brown flames; aperture white.

Remarks.—The above species is allied to *M. semen*, Rve.

TURRICULA (COSTELLARIA) FORTIPLICATA, Pease.—Pl. 5, fig. 3.

Description.—T. fusiformi, utrinque attenuata, longitudinaliter plicato-costata, interstitiis transversim sulcata, spira granulosa; basi transversim granuloso-costata, subrecurva; labro intus lirato; columella forte triplicata, superne callosa; apertura longitudinis testæ dimidiam haud æquans, luteo-castanea, anfr. ultimo inferne, apiceque albis.

Dimensions.—Long. 8, diam. 3 mill.

Habitat.—Paumotus.

Shell fusiform, attenuated at both ends, longitudinally strongly plicately ribbed, interstices grooved transversely; spire granulose; base slightly recurved and granosely ribbed transversely; lip lirate within; columella three-plaited, with a callosity at top, plaits prominent and large; yellowish-chestnut, lower half of last whorl and apex white.

TURRICULA (COSTELLARIA) PLICATULA, Pease.—Plate 15, fig. 4.

Description.—T. fusiformi, utrinque attenuata, longitudinaliter irregulariter plicato-costata, transversim tenui striata, basi contracta, recurva, transversim granuloso-costata: columella quadruplicata; rufo-castanea, fasciis duabus aut tribus, lutescentibus cincta.

Dimensions.—Long. 8, diam. 3 mill.

Habitat.—Paumotus.

Shell fusiform, attenuated at both ends, longitudinally irregularly plicately ribbed, ribs becoming obsolete on back of last whorl, transversely very finely striate; contracted and recurved at base; base encircled by granulose ribs; columella four-plaited; reddish-chestnut, encircled by two or three yellowish bands.

TURRICULA (PUSIA) NODULOSA, Pease.—Plate 15, fig. 5.

Description.—*T. crassa*, oblongo-ovata, turrita, longitudinaliter nodoso-costata, costis rotundatis, remotis, vix obliquis, anfr. ultimi inferne subevanidis, transversim confertim elevato-striata; anfr. rotundatis; columella quadriplicata, superne vix callosa; alba, striis in parte inferiori rufo-castaneis.

Dimensions.—Long. 10, diam. $4\frac{1}{2}$ mill.

Habitat.—Paumotus.

Shell thick, oblong ovate, longitudinally nodosely ribbed, ribs round, prominent, remote, somewhat oblique and curved, on the spire and upper part of the last whorl swollen, becoming obsolete on the lower part of the body whorl, transversely encircled with close set elevated striæ; whorls rounded; spire turritid; columella four-plaited, slightly callous at top; white; striæ on lower half of the whorls, reddish-chestnut.

Remarks.—The above species in shape and sculpture resembles some varieties of *M. rubra*, Brod.

The latter species, answering to the original description by Broderip, occurs only at the Paumotus; those of Reeve's description inhabit both the Hawaiian Islands and Paumotus. There is still another distinct variety, lineated transversely,—a perfect gem, when alive and in good condition.

TURRICULA (S. G. PUSIA) PUTILLUS, Pease.—Plate 15, fig. 24.
Proc. Zool. Soc. London, 1865.

Description.—*T. abbreviato-fusiforini*, subventricosa, sulcis angustis decussata, sulcis longitudinalibus tenuiter striatis; spira breviuscula; acuta, suturis valde impressis; apertura intus valde lirata; labro denticulato; columella quadriplicata; nigra; spira et anfractu ultimo superne, albo maculatis; interdum fasciâ interrupta albo cingulatis, sulcis transversis rufo-fuscis.

Dimensions.—Long. 10, diam. 5 mill.

Habitat.—Central Pacific.

Shell abbreviately fusiform, somewhat ventricose, whole surface decussated by narrow grooves, longitudinal grooves finely stri-

ated; spire rather short and acute, sutures well impressed; aperture strongly lirate within; lip denticulate; columella four-plaited; black, spire and upper part of body whorl spotted with white, occasionally encircled with a single narrow white band, transverse grooves reddish-brown.

Remarks.—This species is allied to *M. alveolus*, Rve., and more distantly to *M. puella*, Rve.

STRIGATELLA BRUNNEA, Pease.—Plate 15, fig. 7.

Description.—T. subobeso-ovata, crassa, solida, basi, spira et anfr. ultimo, parte superiori, transversim tenuiter striatis, striis remotis; spira brevis; labro simplici, superne calloso, vix sinuato; apertura superne angusta, ad basim effusa: columella quadriplicata, castanea, apice alba, apertura alba, polita, epidermide tenui induta.

Dimensions.—Long. 21, diam. 10 mill.

Shell somewhat stoutly ovate, solid, thick; base, spire and upper part of last whorl transversely, rather remotely finely striate, most distinct on base; spire short, about one-third the length of the shell; outer lip simple, callously thickened above and slightly sinuate, just below the junction with body whorl; aperture narrow above, effuse at base; columella four-plaited; chestnut color, apex tipped with white, aperture polished, white; covered with a thin epidermis.

Remarks. Belongs to the group represented by *M. columbelliformis*.

STRIGATELLA NIGRICANS, Pease. Proc. Zool. Soc. London, 1865.

Description.—T. fusiformi, elongata, lævigata, transversim tenuiter striata, striis subdistantibus, punctatis; epidermide tenui induta; spira gracili, elongata, acuta; labro simplici; columella quadriplicata; nigrescente, fascia angusta, castanea cineta, apertura plumbea.

Dimensions.—Long. 20, diam. 7 mill.

Shell fusiform, elongate, smooth, finely striated transversely, striae somewhat remote, punctured; covered with a thin epidermis; spire slender, elongate, acute; lip simple; columella four-plaited; black, encircled by a narrow chestnut band, aperture lead color.

THALA ALBA, Pease.—Plate 15, fig. 8.

Description.—T. elongata, gracilis, fusiformi, tenuiscula,

transversim striata, striis minutissimis decussata; labro in medio incrassato; columella quadriplicata; alba.

Dimensions.—Long. $7\frac{1}{2}$, diam. 2 mill.

Habitat.—Paumotus.

Shell elongate, slender, fusiform, rather thin, striated transversely, decussated with very fine longitudinal striæ; aperture slightly effuse at base, somewhat contracted and thickened in the middle; columella four-plaited; color none, white.

THALA ANGIOSTOMA, Pease.—Plate 15, fig. 9.

Description.—T. elongata, attenuata; anfr. plano-convexis, granulatis; labro dentato; apertura angusta, columella quinqueplicata; canali elongato, recurvo; alba.

Dimensions.—Long. 12, diam. $3\frac{1}{2}$ mill.

Habitat.—Paumotus.

Shell elongate, slenderly fusiform, attenuated at both ends, whole surface evenly granulated; whorls flatly convex; outer lip dentate its whole length; columella five-plaited; aperture very narrow; canal long and recurved; wholly white.

Remarks.—The sculpture of this species resembles *T. recurva*, Rve.; its shape is similar to that of *T. mirifica*, Rve.

THALA SALTATA, Pease. Proc. Zool. Soc. London, 1865.

Description.—T. fusiformi, subulata, elongata, tenui, nitida, pellucida, cornea; basi subtruncata, transversim striata, longitudinaliter subtilissime striata; anfr. planis seu subconvexis, marginatis; columella tri seu quadriplicata, plicis obliquis; apertura ampliore, dimidium longitudinis testæ æquante; labro tenui.

Dimensions.—Long. 7, diam. 2 mill.

Shell fusiform, elongate, subulate, rather thin, shining, pellucid, corneous; base subtruncate, transversely striate, longitudinally very finely striated; whorls plane or flatly convex, margined; columella three or four-plaited, plaits oblique; aperture rather open, about one-half the length of the shell; lip thin.

Remarks.—To the above three species should be added *Pleurotoma todilla*, Migh., Proc. Bost. Soc., 1845; and we are of opinion that *Thala* should be raised to the rank of a genus.

PLEUROTOMIDÆ.

CITHARA DECUSSATA, Pease.—Plate 15, fig. 10.

Description.—T. fusiformi, ovata; anfr. superne angulatis, longitudinaliter plicato-costatis, costis e suturis descendentibus, ad angulum subnodosis, transversim elevato striatis, striis minutissimis decussatis; apertura dimidium longitudinis testæ æquante.

Dimensions.—Long. 10, diam. $4\frac{1}{2}$ mill.

Habitat.—Paumotus.

Shell fusiformly ovate, whorls somewhat concavely, widely angulated around the upper part, longitudinally plicately ribbed, ribs descending from the sutures, nodulous at the angle, transversely elevated, striated, decussated by very fine longitudinal striæ; aperture one-half the length of the shell; white.

CITHARA BREVIS, Pease.—Plate 15, fig. 11.

Description.—T. ovata, spira brevi, subobtusa; anfr. longitudinaliter forte costatis, costis rotundis, ad suturas erectis, transversim elevato-striatis; sutura profunda; alba, fasciis fuscis cincta.

Dimensions.—Long. 8, diam. 4 mill.

Habitat.—Paumotus.

Shell ovate, spire short, obtuse; whorls longitudinally strongly ribbed, ribs rounded, erect at the sutures, and slightly overlapping each other, transversely encircled by very fine striæ, sutures deep; aperture more than one half the length of the shell; white, banded (apparently) with brown.

CITHARA PAUCICOSTATA, Pease.

Description.—T. oblongo-ovata, spira turrita, acuta, breviuscula: anfr. ad suturas angulatis, longitudinaliter costatis, costis 7, prominentibus, compressis, suturam incurrentibus, interstitiis concavis, transversim subtilissime conferte striatis; suturis profundis; omnino alba.

Dimensions.—Long. 7, diam. 3 mill.

Habitat.—Tahiti.

Shell oblong ovate, spire rather short, turritid, acute; whorls angulated at the sutures, longitudinally ribbed, ribs 7, very prominent, compressed, running into the sutures, interstices concave, finely, regularly and closely striate transversely; sutures deep; wholly white.

CITHARA DÆDALEA, Pease.—Plate 15, fig. 13.

Description.—T. elongato-fusiformi, spira turrita; anfr. ad suturas angulatis, longitudinaliter costatis, costis 10, compressis vix recurvis, e suturas descendentibus, transversim tenuiter lirata; alba, anfr. ultimo castanea tincto.

Dimensions.—Long. 6, diam. 2 mill.

Habitat.—Paumotus.

Shell elongately fusiform, spire turritid; whorls angulated at the suture, longitudinally ribbed, ribs about 10 in number, compressed, somewhat curved, descending from the sutures, transversely finely and closely ridged; white, back of the last whorl stained with chestnut.

CLATHURELLA TUMIDA, Pease.—Plate 15, fig. 14.

Description.—T. oblonga, subcylindrica, transversim, tenuiter, conferte lirata; longitudinaliter costata, inferne costis evanidis; spira brevissima; anfr. spiræ tumidis; labro incrassato; apertura breviuscula; sinu lato, profundo; canali brevi, lato; alba, interdum liris transversis rufo-castaneis.

Dimensions.—Long. 8, diam. 3 mill.

Habitat.—Paumotus.

Shell oblong, somewhat cylindrical, light, faintly and closely ridged transversely; spire very short, the two last whorls comprising three-fourths the length of the shell; longitudinally ribbed, ribs obsolete or disappearing altogether on the two last whorls; whorls five, those of the spire inflated, last whorl rather out of the centre; sutures well impressed; outer lip thickened externally; aperture rather short; sinus broad and rather deep; canal short and open; white, transverse ridges occasionally reddish-chestnut.

Remarks.—In sculpture and general shape the above species resembles the *Daphnellæ*. The inflation of the whorls of the spire and the extreme shortness of the upper whorls distinguish it. On young specimens the inflation is scarcely perceptible.

CLATHURELLA VIOLACEA, Pease.—Plate 15, fig. 15.

Description.—T. gracilis, elongata, nitida, subcylindrica, liris creberrimis, undique eleganter clathrata; apertura parva; sinu profundo; canali brevissimo; violacea, fasciis duabus albis cingulata.

Dimensions.—Long. $5\frac{1}{2}$, diam. 2 mill.

Habitat.—Paumotus.

Shell slender, elongate, shining, somewhat cylindrical; whole surface beautifully closely clathrated by longitudinal and transverse ridges, granulated at their intersection; aperture small; sinus deep; canal very short; violet color, encircled with two white bands, tip of apex yellow.

Remarks.—Nearly allied to *B. pumila*, Migh., inhabiting the Sandwich Islands.

CLATHURELLA MACULOSA, Pease.—Plate 15, fig. 16. Proc. Zool. Soc. London, 1862.

Description.—T. oblonga, fusiformi-ovata, longitudinaliter costata, costis 8, rotundis, confertis, transversim lirata; anfr. plano-convexis, spira acuminata; apertura dimidiam longitudinis testæ haud æquante; alba, nitida, costis rufo-castanea maculatis.

Dimensions.—Long. 5, diam. 2 mill.

Habitat.—Paumotus.

Shell oblong, fusiformly ovate, longitudinally ribbed, ribs round, close set, descending from the sutures, about eight in number, transversely strongly ribbed; whorls flatly convex; spire acuminate; aperture rather less than one-half the length of the shell; white, shining, ribs sparsely spotted with reddish-chestnut, the color extending sometimes the whole length of the shell.

Remarks.—This species may be compared with *C. tessellata*, Hinds, which occurs at the same locality. It is, however, smaller than the latter species, and is strongly ribbed and ridged.

CLATHURELLA CANALICULATA, Pease.—Plate 15, fig. 17.

Description.—T. oblongo-ovata, spira subacuminata; longitudinaliter costata, costis 14, rotundatis, c. suturis descenditibus; transversim lirata, interstitiis striis minutissimis decussatis; ad suturam conspicue canaliculata; canali brevi, subrecurvo; labro forte dentato; columella lirata; rubida, fascia alba cincta, infra fasciam, linea fusca marginata, sutura fusca.

Dimensions.—Long. 11, diam. $4\frac{1}{2}$ mill.

Habitat.—Paumotus.

Shell oblong ovate, ribbed longitudinally, ribs about 14 in number, rounded, descending from the sutures, very prominent on the spire and middle of last whorl, transversely ridged, interstices decussated by microscopic striæ; spire somewhat acuminate; sutures widely and deeply canaliculate; canal short,

slightly recurved; lip strongly dentate; columella ridged; dark rose red, encircled by a single white band, which is bordered beneath by a dark reddish-brown line, sutures stained with the same color.

Remarks.—The above species is allied to *C. rubida*, Hinds. Its chief peculiarity is the canaliculation of the suture, which we find on all specimens, from the young to mature age. The longitudinal ribs are more numerous.

DRILLIA LAUTA, Pease.—Plate 15, fig. 18.

Description.—*T. turrita*; anfr. in medio nodosis, ad suturas late concavo-angulatis, nodis longitudinalibus, prominentibus; sinu lato, profundo; canali lato; flavo-castanea, anfr. ultimo fasciis tribus albis cingulata, spira unifasciata, fasciis in medio linea rufo-castanea cincta.

Dimensions.—Long. 9, diam. 4 mill.

Habitat.—Paumotus.

Shell turrited, whorls nodose on the middle, nodules rather prominent, longitudinally disposed, beneath the sutures widely concavely angulated, on the spire the angulation occupying one-half of the whorls; canal short, open; sinus broad and deep; yellowish-chestnut, last whorl encircled with three white bands and the spire with one, through the centre of which passes a line of reddish-chestnut.

Remarks.—The most beautiful species of the group represented by *D. lata*, Hinds, *nodifera*, Pease, *nodulosa*, Pease, &c. We have several additional species, in too bad condition for description.

DRILLIA EXILIS, Pease.—Plate 15, fig. 19.

Description.—*T. gracilis*, lævigata, elongata, subcylindrica; spira elongata, longitudinis testæ dimidiam æquante; anfr. subplanulatis, longitudinaliter plicato-costatis, costis parvis, confertis, e suturas descendentibus; apertura brevis; canali lato, brevi; rufo-castanea, costis, interdum interstitiis, pallide cinereis.

Dimensions.—Long. $5\frac{1}{2}$, diam. 2 mill.

Habitat.—Tahiti.

Shell slender, smooth, elongate, somewhat cylindrical, spire long, one-half the length of the shell; whorls nearly plane, plicately ribbed longitudinally, ribs small, close, descending from the sutures; aperture very short; canal short and open; reddish-chestnut, ribs and sometimes the interstices pale ash color.

DAPHNELLA CRENULATA, Pease.—Plate 15, fig. 20.

Description.—T. elongata, cylindrica, alba, transversim tenuiter lirata, interstitiis transversim striatis, longitudinaliter obsolete et irregulariter costata; sutura utrinque costis crenulatis, marginata; apertura breviuscula; sinu lato, profundo.

Dimensions.—Long. 7, diam. 2 mill.

Shell elongate, slender, cylindrical, white, transversely finely ridged, interstices striated transversely, longitudinally faintly and obsoletely irregularly ribbed; sutures bordered on each side by a crenulated rib, the crenulations connected obliquely by a small ridge; aperture rather short, sinus broad and deep.

Remarks.—Nearly allied to *P. axis*, Reeve.

DAPHNELLA VARICIFERA, Pease.—Plate 15, fig. 21.

Description.—T. elongata, recto-acuminata, tenui, liris longitudinalibus et transversis decussata; anfr. 6, plano-convexis, varice hic illis instructis; apertura lata; canali brevi; alba, rufo-castanea tineta.

Dimensions.—Long. 17, diam. 5 mill.

Habitat.—Paumotus.

Shell elongate, straightly acuminate, rather light, thin, decussated by longitudinal and transverse ridges; whorls six, flatly convex, furnished here and there with somewhat indistinct varices; aperture wide; canal short; white, stained with reddish-brown.

Remarks.—The *Daphnellæ* have so many characters in common, that it is difficult to determine the limits of the species. The above is closely allied to *D. delicata*, Rve.

DAPHNELLA CURTA, Pease.—Plate 15, fig. 22.

Description.—T. abbreviata, ovata, transversim regulariter granuloso-lirata, longitudinaliter indistincte striata; spira curta; apertura latiuscula, dimidium longitudinis testæ æquante; alba.

Dimensions.—Long. $4\frac{1}{2}$, diam. 2 mill.

Habitat.—Paumotus.

Shell abbreviate, ovate, transversely, regularly finely granulosely ridged; longitudinally indistinctly striate; spire short; aperture rather open, about one-half the length of the shell; wholly white.

Remarks.—The above may be mistaken for the young of other species; but the lip denotes maturity.

PLEUROTOMA BICARINATA, Pease.—Plate 15, fig. 23. Proc. Zool. Soc. London, 1862.

Description.—T. turrita, elongata, alba; anfr. 6, undique striis elevatis clathratis, anfr. ultimo carinis duabus, spiraque unica ornatis, carinis eminentioribus, anfr. e carinis ad suturas obliquis, juxta suturam vix angulatis, anfr. ultimo inter carinis plano; labro expanso, crenulato; canali tortuoso, recurvo; sinu perangusto, profundo, rima rotunda terminato.

Dimensions.—Long. 10, diam. 5 mill.

Habitat.—Kingsmill Is.

Shell turrited, elongate, white; whorls 6, clathrated throughout by longitudinal and transverse elevated striæ, the last whorl ornamented with two and the spire with one keel, keels very prominent, crenulated on their edge, the whorls descending obliquely from the keels to the suture, the middle of the last whorl between the keels plane, at the sutures slightly angulated; lip expanded, on its surface radiately ridged; canal twisted, recurved; sinus a very narrow deep slit, terminating in a round hole.

Remarks.—This bold and exquisitely sculptured species is unlike any of the Family. Its chief peculiarity is the form of its sinus.

DESCRIPTIONS OF NEW SPECIES OF LAND SHELLS,
INHABITING POLYNESIA.

BY W. HARPER PEASE.

PARTULA OBESA, Pease.—Plate 15, fig. 12.

Description.—T. umbilicata, abbreviata, conico-ovata, tenuiscula, transversim confertim minutissime undulato-striata; anfr. $4\frac{1}{2}$, ultimus magnus, inflatus, oblique productus, longitudinis testæ 3-4 subæquans, basi rotundatus; spira brevis, conica, acutiuscula; apertura obliqua, ovata; labro valde planulatim expanso, alba; columella superne vix dilatata; virescente-flavida, infra suturas fascia alba cingulata.

Dimensions.—Long. 20, Diam. 14 mill.

Hab ?

Shell umbilicate, abbreviate, conically ovate, rather thin, light, transversely very finely, closely and undulately striated; whorls $4\frac{1}{2}$, the last very large, comprising nearly three-fourths the length of the shell, somewhat inflated and produced obliquely, rounded at base; spire short, conical, rather acute; aperture oblique, ovate; lip widely flatly expanded, white on both its outer and inner sides; columella slightly expanded above; greenish yellow, encircled with a broad white band beneath the suture.

Observations.—We have no locality for the above species. It appears to approach the Marquesan type, and *may* be allied to *litacina*, Pfr. It is covered with a thin epidermis, which, when worn off, would probably leave the shell without color, as is the case with *Ganymedes*, Pfr. We have but a single specimen.

PARTULA AFFINIS, Pease.

Description.—T. elongato-ovata, solidiuscula, haud nitens, compresse umbilicata, dextrorsa; anfr. 5, plano-convexis, ultimus $\frac{2}{3}$ longitudinis testæ subæquans, sutura impressa, interdum submarginata; longitudinaliter tenui rugosim irregulariter striata, transversim minutissime striata; apertura ovata; labro anguste calloso, interdum margine columellari adnato; columella dentata; castanea, interdum longitudinaliter straminea strigata, aut omnino straminea.

Var.; fasciis tribus fuscis cingulata.

Dimensions.—Long. 16, diam. 9 mill.

Habitat.—Tahiti.

Shell elongately ovate, rather solid, compressly umbilicate, dextral, finely, roughly and irregularly striated longitudinally, transversely very minutely striate, sutures impressed, sometimes faintly marginated; lip narrowly thickened, occasionally connected with the columella by a thin callosity; columella dentate. Color light or dark chestnut brown, sometimes striped with darker or wholly of a straw color.

Var.; encircled with three dark reddish brown bands, on middle of last whorl, at the umbilicus, and just beneath the suture.

Observations.—The above species is allied to *P. Otaheitana*. It is, however, smaller and less elongate.

PARTULA LINEOLATA, Pease.

Description.—T. abbreviato-ovata; solida, umbilicata, haud nitens, transversim tenuiter et confertim striata, longitudinaliter striis incrementis rugosa; anfr. 5, plano-convexis, sutura impressa; apertura rotundo-ovata; perist. rotundo-callosa, marginibus callo junctis; columella dentata; rufescente-fusca, apice purpurascente, longitudinaliter strigis cinereis irregulariter ornata.

Dimensions.—Long. 15, diam. 10 mill.

Habitat.—Tahiti.

Shell shortly ovate, solid, umbilicate, rather dull, transversely finely, closely and regularly striated, somewhat roughened longitudinally by lines of growth; whorls 4, planely convex, suture impressed; aperture roundly ovate, lip roundly thickened and united by a callus over the body whorl; columella dentate; color dark reddish brown, with light-colored longitudinal lines,

which appear to be formed by the abrasure of the epidermis ; apex brownish purple.

Var. ; pale straw color or light reddish brown.

Observations.—Allied to *P. filosa*, Pfr., inhabiting the Samoa Islands. Classed by Mr. Reeve as *var.* of *Otaheitana*. Con. Icon., fig. 11c.

REALIA COSTATA, Pease.

Description.—T. ovato-turrita, umbilicata, longitudinaliter costata, costis ad anfr. ultimum obsoletis ; anfr. 6, rotundatis, suturis profundis ; perist continuo, vix everso, anfr. penultimo disjuncto ; apertura rotundato-ovata, intus aurantia ; albida vel dilutè cornea.

Dimensions.—Long. 6, diam. $3\frac{1}{2}$ mill.

Habitat.—Tahaa.

Shell ovately-turritid, umbilicate, longitudinally ribbed, ribs becoming obsolete on the last whorl ; whorls 6, rounded, sutures deep ; peristome continuous, slightly everted, not joining the penultimate whorl ; aperture roundly ovate, orange color within. Color white or light horn color.

Remarks.—The above species, together with *R. Tahitensis*, Pease, and *scalariformis*, Pease, differ from all other species of the genus, in being prominently ribbed.

We proposed to unite them under the generic name of *Sealinella*. They present the following characters :—Scalariform in shape, the forms being rounded and separated by a deep suture ; peristome continuous, disconnected from the penultimate whorl, and somewhat porrected ; longitudinally strongly ribbed.

The operculum is of the *Realia* form.

REALIA ELONGATA, Pease.

Description.—T. elongata, turrita, solida, umbilicata ; anfr. 7. convexis, ad marginibus vix rotundato-angulatis ; circum umbilicum rotundata ; suturis valde impressis ; spira elevata, acuta ; apertura rotundato-ovata, intus crocea, vel aurantia ; perist continuo, vix everso, anfr. penultimo adnato ; albida, aut pallide rosacea.

Dimensions.—Long. $10\frac{1}{2}$, diam. 4 mill.

Habitat.—Raiatea.

Shell elongate, turritid, solid, umbilicate, rounded at umbilical region ; whorls 7, convex, somewhat roundly angulate at their

margins; suture well impressed; spire elevate, acute; aperture roundly ovate, yellowish orange within; peristome continuous, adhering to the penultimate whorl. Whitish or pale flesh color.

HELICINA DISCOIDEA, Pease.

Description.—T. depressa, tenuiscula, vix nitidula, oblique tenuiter et irregulariter rugoso-striata; spira breviter conoidea; anfr. 5, plano-convexis, ultimus depressis, ad peripheriam costato-carinatus; apertura triangulari-lunaris, perist simplici acuto, vix reflexo, ad basim acute angulato, subemarginato, super basim callo continuato; columella callum copiosum, subgranulosum, circumscriptum; callo sulco arcuato marginato. Subrufa, interdum straminea vel cornea.

Dimensions.—Diam. maj. $5\frac{1}{2}$, min. 5, alt. 3 mill.

Habitat.—Tahaa.

Shell depressed, rather thin and dull, obliquely, finely and irregularly roughly striate; spire depressedly conoidal; whorls 5, flatly convex, the last depressed and ribbed; carinate on the periphery; aperture triangularly lunate; peristome simple, acute, slightly reflected, acutely angulate at base and slightly emarginate, continued over base by a callosity; columella region covered with a copious, depressed subgranulose callosity, which is margined on its outer edge by a groove. Color reddish, sometimes of a straw or horn color.

Remarks.—The above species, together with our MSS. *faba* and *tenuiscula*, have been referred, by Mr. Cuming, to *albolabris*, Hom. and Jacq. The latter, *tenuiscula*, is, without doubt, the *albolabris*, having been collected at the same island, and agrees with the description of that species.

The above is, however, distinct, and the *faba* is an analogous form, inhabiting a neighboring island.

HELICINA OCEANICA, Pease.

Description.—T. parva, tenuiscula, nitida, depressa; spira vix elevata, plano-convexa, oblique subtilissime striata; anfr. 4-5, ultimus ad peripheriam acute carinatus, umbilicum callo induta, sulco marginatum; apertura lunaris; labro, simplici acuto; flavescens aut albicans, utrinque lineis aut fasciis undulatis rufo-fuscis vel fuscis radiatim ornata.

Dimensions.—Diam. 3, alt. $1\frac{1}{4}$ mill.

Habitat.—Ins. Kingsmill.

Shell small, thin, shining, depressed; spire scarcely elevated, planely convex, obliquely, very minutely striate; whorls 4 or

5, acutely carinate at periphery; umbilical region covered with a callosity, which is margined by a groove; aperture lunar, lip simple, acute. Color whitish or yellowish, ornamented with undulating, radiating lines or bands of a reddish brown color.

Remarks.—Allied to *H. articulata*, Pfr., inhabiting the New Hebrides.

HELICINA MAUGERLÆ, Gray. Var., RUBICUNDA, Pse.

Our MSS. species, *H. rubicunda*, has been classed by Mr. Cuming as a *var.* of *Maugeriæ*. It is, however, larger and more solid. The color of the basal callosity of the type is bright yellow, and the whorls encircled by two broad reddish bands.

The basal callosity of the above *var.* is of a deep blood red, and the whorls of the same color, with a white line encircling them at either edge. The above variations are constant and distinct.

Habitat.—Raiatea.

SUCCINEA LABIATA, Pease.

Description.—T. oblongo-ovata, solidiuscula, longitudinaliter striata, transversim sparsim sulcata; spira mamillata; anfr. 2; apertura amplissima, ovata, testam fere adæquans; perist. continuo; labro incrassato; rufescente succinea.

Dimensions.—Long. 19, diam. 12 mill.

Habitat.—Raiatea.

Shell oblong ovate, solid, longitudinally striate, transversely sparsely sulcate; spire mamillate; whorls 2; aperture ovate, widely open, nearly the size of the shell; peristome continuous; lip thickened on its edge; color reddish.

Remarks.—*S. ovata*, Pse. MSS., is the *S. papillata*, Pfr. The above we hold to be distinct.

HELIX CONSIMILIS, Pease.

Description.—T. depressa, sublenticularis, tenuiscula, utrinque conferim radiatim costellata, supra fusco et luteo testellata, infra rufo-castanea, interdum rufo-fusca strigata, late umbilicata; anfr. 5, convexis, suturis impressis, interdum subangulatis; anfr. ultimus medio interdum subdepressus, ad umbilicum et peripheriam rotundatus; apertura rotundato-lunaris, lamella unica volvente instructa; labro simplici, acuto.

Dimensions.—Diam. 4, alt. 2 mill.

Habitat.—Tahiti.

Shell sublenticular, depressed, rather thin, closely radiately ribbed, on the base ribs rather more close and smaller; tessellated above with reddish chestnut and yellowish; base reddish chestnut, sometimes radiately striped with reddish chestnut; openly umbilicate; whorls 5, convex, sutures impressed, whorls occasionally slightly angulated at their edge; last whorl slightly depressed above; in the middle, at the umbilicus, and on the periphery rounded; aperture roundly lunate, furnished with a single lamina, revolving within; lip simple, acute.

Remarks.—Allied to *H. radiella*, Pfr., inhabiting the Island of Rapa, Austral Group.

NANINA VERTICILLATA, Pease.

Description.—T. orbicularis, tenuis, fragilis, lucida, pallide fusco-cornea, imperforata; spira vix elevata; anfr. 5, convexis, conferte marginatis, sutura impressa; anfr. ultimo ad peripheriam rotundato, in foveam centralem devexo; apertura transversalis, semilunaris; labro simplici tenui.

Dimensions.—Diam. 6, alt. 4 mill.

Habitat.—Moorea.

Shell orbicular, thin, glassy, fragile, shining, light brownish horn color, imperforate, slightly indented at the umbilical region; spire slightly elevated, obtuse; whorls 5, convex, narrowly margirated, the last rounded at periphery, sutures impressed; aperture transverse, semilunar, lip thin, simple.

Remarks.—The above differs in several respects from *H. brunnea*, Anton, to which species it was referred by Mr. Cuming.

It belongs to the *Nanina* family in common with all the small glassy species inhabiting Polynesia. The animal of the above is pale, with stout blackish tentacles, foot narrow, rounded behind, and during locomotion does not project beyond the shell. Mucus papilla conical.

HELICINA FLAVESCENS, Pease.—Plate 15, fig. 25.

Description.—T. depresso conoidea, subsemiglobosa, solida, sublente concentrice striata, distantioribus brevissimæ pilosis munita, straminea; spira obtusa; anfr. 4, convexiusculi, ultimus ad peripheriam carinatus, infra marginatus, basi convexus; columella simplex, callum albidum, circumscriptum retrorsum emitens; perist simplex, brevissime reflexiusculum, crassiusculum; apertura late semilunaris, subtriangularis.

Dimensions.—Diam. 6, alt. 3 mill.

Habitat.—In Insula Mangaia.

Shell depressly conoidal, somewhat globose, solid, concentrically striate, striæ distant, very fine, and furnished with short hairs; spire obtuse; whorls 4, flatly convex, the last carinate at the periphery, and margined beneath by a slight groove, base convex; columella simple, spreading out in a thin light-colored callosity; peristome simple, very slightly recurved, and its edge somewhat callous, especially at its base; aperture widely semilunar, subtriangular. Bright or pale straw color.

Remarks.—The above species is apparently allied to *H. Küsteriana*, Pfr., collected by Mr. Cuming at Tahiti. Several species of this type inhabit Polynesia, which we will review hereafter. The short hairs on this species follow the striæ, and easily rub off, when the striæ become very indistinct.

HELICINA ZIGZAG, Pease.—Plate 15, fig. 26.

Description.—T. trochiformis, solidiuscula, tenuiter oblique striata; spira depressa conoidalis; flavida, flammis aut lineis rufescentis, undulatis ornata; anfr. 4, convexiusculi, ultimus ad peripheriam costato-carinatus, basi convexus; columella verticalis, brevis, basi angulata, callum tenuem flavidum, sub lente granulatum, emittens; perist. vix reflexiusculum; apertura late semilunaris; operc. semilunaris, tenuisculum, rubellum.

Dimensions.—Diam. $6\frac{1}{2}$, alt. 4 mill.

Habitat.—In Insula Oualan.

Shell trochiform, rather solid, finely striated obliquely; spire depressly conoidal; yellowish, ornamented with oblique, undulating, reddish flammules or lines; whorls 4, slightly convex, the last rib carinate at its periphery, base convex; columella short, vertical, angulated at its junction with outer lip; basal callosity thin, yellowish, very minutely granulated; peristome slightly reflexed; aperture widely semilunar; operculum semilunar, rather thin, reddish.

TAHEITEA PALLIDA, Pease.

Description.—T. non rimata, cylindracea, scalariformis, decollata, tenuiscula, lævigata, nitida, subtranslucida, albida; anfr. 4, rotundato-convexis, ad suturam vix rotundato-angulatis; sutura bene impressa; costis prominentis, rectis numero apud 20; apertura verticalis, ovalis, vix porrecta; perist. continuum, margine dextro leviter expansum tenuisculum latere columellari incrassatum.

Dimensions.—Diam. $6\frac{1}{2}$, alt., $2\frac{1}{2}$ mill.

Habitat.—Ins. Tahiti et Huahine.

Shell imperforate, cylindrical, scalariform, decollate, rather

thin, white, shining, translucent; whorls 4, roundly convex at the suture, somewhat roundly angulate; suture well impressed; ribs prominent, straight, vertical, about 20 in number; peristome continuous, on its outer edge rather thin, slightly expanded, on the columella side callously thickened; aperture vertical, oval, very slightly porrected.

TRUNCATELLA PACIFICA, Pease.—Plate 15, fig. 27.

Description.—T. subrimata, cylindracea, truncata, sursum leviter attenuata, solidiuscula, nitidula; costis verticalis, prominentis, paulum curvatis, numero apud 25; sutura impressa; anfr. 4-5, subconvexis, ultimus basi rotundato-carinatus; apertura verticalis, angulato-ovalis; perist continuum expansiusculum, adnatum; alba, aut pallide rosacea.

Dimensions.—Diam. 3, alt. 8 mill.

Habitat.—In Insula Oualan.

Shell subrimate, cylindrical, truncate, spire slightly attenuate, rather solid, shining; ribs vertical, prominent, slightly curved, in number about 25; suture impressed; whorls 4-5, somewhat convex, the last roundly carinate at base, at the umbilical region; aperture vertical, angulately oval; peristome continuous, slightly expanded, united with the penultimate whorl. White or pale flesh color.

PARTULA ASSIMILIS, Pease.—Plate 15, figs. 28, 29.

Description.—T. elongato-ovata, tenuiscula, nitida, anguste umbilicata; anfr. $4\frac{1}{2}$, rotundato-convexis, sublente spiraliter striatis, striis confertis, vix undulatis, ultimus leviter inflatus; sutura impressa; apertura ovalis, obliqua; pallide straminea, apice rufo-fuscescente, interdum longitudinaliter flammis castaneis picta et labro colore tineto.

Dimensions.—Diam. 9, alt. 17 mill.

Habitat.—In Insula Roratonga.

Shell elongate ovate, rather thin, shining, narrowly umbilicate; whorls $4\frac{1}{2}$, roundly convex, minutely concentrically striate, striæ close and somewhat undulating, the last whorl slightly inflated; suture impressed; aperture oval, oblique; pale straw color; apex dark reddish brown, sometimes ornamented with longitudinal reddish brown flammules or stripes, and the lip colored.

Remarks.—This species can scarcely be distinguished from a certain variety of *P. varia*, Brod., which inhabits Huahine (Tahitian Group). Comparing large numbers, the above is more abbreviate, whorls more convex, and the aperture narrower.



Drawn by E. J. Nolan M.D.

Bowen & Co. lith. Philada.

NOTES ON THE REMARKS OF DR. P. P. CARPENTER
(PUBLISHED IN PROC. ZOOL. SOC. LOND., 1865.*) ON
CERTAIN SPECIES OF MARINE GASTEROPODA, NAMED
BY W. HARPER PEASE.

BY W. HARPER PEASE.

The species referred to were forwarded to London, with many others, during the year 1863, for identification, accompanied with descriptions for publication, in case they should prove to be new. So many years have passed by since they left me, that I have detected the synonymy of a few; and having collected more perfect specimens of others, have altered their names, not supposing my MSS. names would ever appear in print.

"*Atys debilis*, Psc., appears to be identical with *A. succisa*, Ehr., and simply a slender var. of *A. alicula*, (? *A. Ad.*,) Ehr."

The above determination was sent me several years since by Mr. Cuming. I have retained my name, as the animal does not agree with that of *succisa*, Ehr.

The two species of Ehrenberg may be varieties of each other. It is impossible to decide on species of *Bullidæ* from the shell alone. Two species of *Haminea* inhabit the Sandwich Islands, the shells of which cannot be distinguished the one from the other; the animals, however, are not only specifically but generically distinct. The group of species represented by *B. ampulla*, *Australis*, etc., cannot be separated from each other without a knowledge of their animals. The one inhabiting the Sandwich Islands I have described as *B. marmorea*. The shells of genera *Lophocercus*, *Volvatella* and *Cylindrobulla* resemble each other so closely that they cannot in some cases be distinguished.

* Reprinted in American Journal of Conchology, ii., 379, 1866.

"*Fissurella granifera*, Pse., is a good species of *Glyphis*."

I will take opportunity of examining the animal of the above species, and report. I have frequently found it alive on the Sandwich Islands.

Rimula fenestrata not in my collection.

"*Conus fusiformis*, Pse., is a small species of *Conella*."

I have collected live and perfect specimens of the above. The whole surface is granulose, resembling much larger species of Cones, inhabiting Polynesia, which belong to genus *Hermes*, Mont. *Conella* is a connecting link between the Conoid and Columbelloid families. It is of little consequence with which it is associated.

"*Cithara costellifera*, Pse. MSS., = *atomella*, Sby., var."

The above name I have changed to *ornata*. I have collected perfect specimens of this species. It is quite distinct from the West Indian form.

"*Borsonia corrugata*, Pse. MSS., = *Clathurella nebulosa*, Pse."

An error, probably, in labels. I have found but one specimen of the *corrugata*, which is a peculiar shell, in several respects, and has never been out of my collection.

"*Natica undulata*, Pse. MSS. Young of *Marroccana*, Chem."

Mature and perfect specimens of the above have been lately found. I agree with Mr. Cuning that it is distinct from the West Coast form. Species of this type inhabit all the Polynesian islands. It has been customary to class them together, under the name of *Marroccana*. It will require an examination of their animals, to determine their relation. I have separated another species on the shape and color of its operculum.

"*Nassa plicata*, Pse. MSS., = dwarf var. of *olivacea*, Brug., = *taenia*, Gme."

The above name being pre-occupied, has been changed to *approximata*. The aperture of this species belongs to *taenia*, Gme.; other parts of the shell to *approximata*, Pse. I have no faith in cosmopolite species, or those common to widely separate and distinct Faunas.

"*Nassa microstoma*, Pse., = a white var. of *dermestina*, Gld."

I have collected perfect specimens of the above within the past few years. The following characters will serve to distinguish it from *dermestina*: Transversely strongly ribbed, columella ridged, with a callosity at top. Outer lip not denticulate, but lyrate within. Banded with dark chestnut, interstices between transverse ribs same color; whorls few in number.

"*Nassa turricula*, Pse. MSS., = *var. of paupera*, Gld."

Correct. *Turricula*, Pse., represents the full characters of the species. Those collected by Am. Ex. at the Samoa's are dwarf varieties.

"*Columbella flammea*, Pse. MSS., = *var. of teniata* Ad. and Rve."

I have discovered that the above species is the *C. Marquesa*, Gask., and not *teniata*. My specimens were collected at Tahiti and the Paumotu, a short distance from the Marquesas.

"*Columbella* like *Australis*, Pse. MSS."

I will not venture to express an opinion on such a species.

"*Sistrum seminodosum*, Pse. MSS., = *elatum*, Blain."

So named in my collection, several years since.

"*Mitra brunnea*, Pse. MSS., = *Strigatella fuscescens*, Pse."

An error has probably occurred from change of labels in the Cumingian Coll. The *brunnea* belongs to the group represented by *Columbellaformis*, while the *fuscescens* is nearly allied to *Ticaonica*. The two species have not a character in common; they belong to different genera.

"*Mitra tessellata*, Pse., MSS., = *puella*, Rve."

I have no species in my collection of the above name, excepting the one figured by Martyn. Dr. C. probably refers to *M. putillus*, Pse., Proc. Zool. Soc., London, 1865. That species approaches *puella*, but is more closely related to *M. alveolus*, Rve.

"*Triton crenulatus*, Pse. MSS., = *antiquatus*, Hinds."

So named in my collection several years past.

A group of small shells inhabit Polynesia, represented by *Cithara ornata*, Pse., *varia*, Pse., etc., which have been referred by Dr. Carpenter to genus *Anachis*, A. Ad. Species also occur on West Coast of America and in the West Indies, which differ but slightly from the Polynesian. Perfect specimens are rarely met with. Having collected a few of each species, I find they present the following characters: Smooth, shining, colors sometimes iridescent, more or less closely ribbed longitudinally, and striated transversely; ribs continuous; aperture narrow, outer and inner lips denticulate or lyrate within, inner lip bordered by a slight callosity, outer lip sinuated at or near its junction with the body whorl.

The denticulations are often worn off, and the sinus is shallowed or entirely disappears, as the edge of the lip is sharp and thin.

I agree with Dr. Carpenter that they should be classed with *Columbellinae*, but not with *Anachis*, A. Ad., which appears to be a conglomerate genus. *C. miser*, *Pacifica*, etc., are not very closely related to the strongly-ribbed Panamic forms, nor to the small iridescent species of Polynesia. I would therefore propose that the latter should be separated under the name of *Seminella*.

I take this opportunity to correct an error in "Report on Mollusca of the West Coast of America," 1863, by Dr. Carpenter. He remarks that *Phasianella rubra*, Pse. MSS., p. 568, belongs to *Aleyna*, A. Ad. *Aleyna rubra*, Pse., is so described in Proc. Zool. Society, London, 1860. I have received from Dr. Carpenter a worn specimen from the washings of shells collected by the Am. Ex. Ex. at our islands, labelled *Phasianella*. It is the *Collonia variabilis*, Pse., Proc. Zool. Soc., London, 1860—the umbilical fissure worn off. The generic characters of *C. variabilis*, Pse., are precisely the same as those of *Turbo phasianellus*, C. B. Ad., which Dr. C. has classed with *Collonia*. (*Vide* Carpenter's Review of C. B. Ad. Cat., etc.)

DESCRIPTION OF NEW SPECIES OF LAND SHELLS FROM
LOWER CALIFORNIA.

BY W. M. GABB.

HELIX STEARNSIANA, Gabb.—Plate 16, fig. 1.

Description.—Shell subglobose, thin, nearly imperforate; whorls five and a half, rounded, last whorl descending slightly at the suture, towards the aperture; spire elevated, suture distinct, not impressed; aperture large, regularly rounded on the outer and lower sides; outer lip white, very slightly thickened and reflected; not continued over the body whorl; umbilicus almost entirely hidden by a reflection of the thickened lip. Surface covered with a very delicate epidermis, sculptured by rather coarse irregular lines of growth crossed by very delicate, revolving, impressed lines, sometimes obsolete and most persistent on the under side. Color beautifully mottled by cloudings of white and brown, irregularly disposed but having a tendency to disposition in an oblique radiating manner; the brown sometimes running together so as to produce imperfect revolving lines; a little above the middle of the shell is a zone of darker brown, with usually a lighter band below, broken and irregular by the white patches and specks.

Animal lead gray, foot whitish.

Observations.—As compared with *H. Kelletti*, Fbs., this shell has not the peculiar flat sloping top to the whorls so characteristic of Forbes' species, the mouth is much less oblique, the umbilicus is not covered, nor are the ends of the lip connected by either callus or plate over the body whorl.

I have made minute comparisons of a large series of the present species, with specimens in the collection of Dr. Newcomb labelled *Kelletti*, Fbs., and sent to him by Hugh Cuming.

Another point of difference is in the locality. Forbes' species

has never been found farther south than San Diego, and its true habitat is probably on one of the islands of the coast, while our species is essentially a Lower Californian, being found under stumps of Magney from Sto. Tomas to a little beyond Rosario.

HELIX LÖHRII, Gabb.—Plate 16, fig. 2.

Description.—Shell discoidal, flattened above, resembling in form *H. sepulchralis* of Ferussac, apex very flat, or in some specimens slightly elevated; whorls four to four and a half; flattened on the upper side, rounded or slightly subangulated above and sloping inwards underneath; suture impressed; body whorl sloping a little on the upper side towards the mouth; aperture broad, oblique, and bordered by a rather heavy and pretty strongly reflected lip not continuous on the inner side, except by an almost imperceptible coating on the body whorl; umbilicus broad, showing all of the whorls. Surface showing, under a glass, besides the ordinary lines of growth, minute punctations, as if the live shell were hirsute; color (all the specimens dead) whitish, with a revolving brown band on the margin of the upper side.

Observations.—This shell differs from *sepulchralis* in its apex being less elevated, and the umbilicus being more open; from *Reverii*, Newc., it can be distinguished by being less elevated, having the mouth more elongated laterally and the lip more expanded. It is a large species.

Locality.—From the higher table lands near Moleje. All of the specimens found were dead.

H. REMONDI, Tryon.

Dead specimens of this species were not rare in the mountains, associated with the preceding, and I was fortunate enough to find a living one at Trinidad, on the west coast, near San Borja, north of the range of *Löhrii*. It overlaps the habitat of that species, and extends farther north, but always in the mountains. It is not improbable that the species given us by Mr. Rémond may have been carried from Moleje to the opposite port of Guaymas, where he obtained them.

The shell is a beautiful translucent horn color, with a strongly marked, dark brown band. The animal is dark grey above, shading into a delicate yellowish-brown on the margin of the foot.

BULIMUS SPIRIFER, Gabb.—Plate 16, fig. 5.

Description.—Shell slender, tapering, minutely perforate; spire high; whorls seven, rounded; suture slightly impressed;

aperture broadly ovate, slightly oblique and subangulated above; peristome broadly expanded, thickest on the outer lip, continued on the body whorl by a plate which becomes a heavy callus in old shells, columella having a very prominent spiral fold in the middle; umbilicus small; color, a delicate whitish horn color, lip white; surface sculptured by irregularly undulating lines of growth crossed by numerous revolving impressed lines, only visible under a magnifier.

Locality.—Found in the mountains, among rocks from San Antonio, below La Paz, to near San Borja, and in the highest mountains perhaps even farther north.

Observations.—This is a strongly characterized species; the fold in the columella separates it from all of the other species found on the peninsula, and a glance at its exterior is also sufficient to distinguish it; it is one of the slenderest of the group, and the lower part of the body whorl has a peculiar obliquity, setting the mouth off to one side in a manner that can hardly be characterized, except by a figure.

BULIMUS VESICALIS, Gould.—Plate 16, fig. 6.

Found dead in the low lands about La Paz; no living specimens were encountered. The specimens differ a little from Gould's figure.

CYLINDRELLA (UROCOPTIS) NEWCOMBIANA, Gabb.—Plate 16, fig. 3.

Description.—Shell moderately large, not decollate, slender, tapering more rapidly below than near the apex, the first three whorls being of the same size; whorls eleven and a half, flattened on the side, body whorl subangular below, detached from the penultimate whorl for a short distance, and acutely angular above; suture impressed; aperture slightly advanced and surrounded by broadly expanded lips, producing a trumpet-shaped appearance; inner margin straight, and ending in an angle above and below; outer margin curved, wider in advance than behind, lips continuous, broadly expanded, and somewhat thickened; surface light horn color, marked by fine, irregular, undulating and occasionally broken ribs, radiately and obliquely disposed, and with the interspaces crossed by microscopic revolving lines.

Animal light grey, equalling in length the aperture and penultimate whorl; foot short, and regularly rounded posteriorly.

Dimensions.—Length 1·9 in., length of aperture ·45 in., width of aperture ·4 in., width of body whorl ·35 in.

Locality.—Hidden under loose volcanic rocks in the high table lands of the interior of Lower California, especially about Moleje. This, and its congener, are essentially mountain species, being only found in the highest regions.

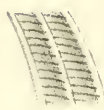
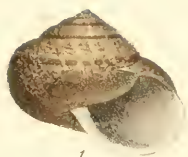
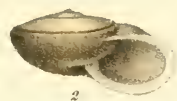
Observations.—This shell resembles *U. costata*, Gould, as figured by Adams in Gen. Recent Moll., pl. 76, fig. 7. It differs, however, in being more regularly tapering, and in being proportionally more slender.

CYLINDRELLA (UROCOPTIS) IRREGULARIS, Gabb.—Plate 16, fig. 4.

Description.—Shell about an inch long, slender, spire irregularly tapering, the first three whorls being of the same diameter, the next five to seven whorls increasing steadily, after which the remainder are nearly of the same diameter; apex not always exactly in the axis of the shell; whorls sixteen to eighteen, rounded on the side, body whorl slightly subangulated below; suture impressed; umbilicus minutely perforate, and bordered by a slight angle; aperture irregular in outline, angulated internally, above and below; outer lip but slightly expanded; inner lip curved internally, and expanded so as to hide the umbilical region in part, most expanded in the middle, and in some specimens distinctly subangulated at this point. Surface sculptured by small longitudinal, slightly arched ribs; color light horn brown.

Observations.—This shell seems at first glance nearly a miniature of *U. Newcombiana*, but has many more whorls, despite its smaller size; it also differs in many other less important details. Found in similar localities, and often associated with that species.

The present shell and *U. Newcombiana* are without doubt congeneric, and an examination of the animal of the latter shows it to be a true *Urocoptis*. The former species, however, so closely resembles the shell described by Adams and Angas as *Subulina* (sub. gen. *Cæliaris*) *Layardi*, from South Africa, that I am led to believe that these authors, in founding the sub-genus, and in the reference of their shell to *Subulina*, have been led into error by external resemblances. Our shell differs from *Layardi* in its smaller size, more slender form, and in the details of the mouth.



Drawn by E. J. Nolan, M.D.

Bowen & Co lith. Phila da

- Fig. 1. *Helix Stearnesiama*, Gabb.
 " 2. " *Löhrii*, Gabb.
 " 3. *Cylindrella Newcombiana*, Gabb.
 " 4. " *irregularis*, Gabb.
 " 5. *Putinus spirifer*, Gabb.
 " 6. " *sufflatus*, Gould.

DESCRIPTION OF TWO NEW SPECIES OF CEPHALOPODS.

BY S. E. HOWELL, M. D.

LOLIGO HEMIPTERA, Howell. Plate 13.

Description.—Body short, thick, cylindrical, obtuse posteriorly, rounded at the extremity, soft fleshy.

Length of the sac 2 inches, diameter at its opening 9 lines, width at the middle of the fins $11\frac{1}{2}$ lines, distance between the fins 9 lines, length of the fins 10 lines.

Fins or caudal appendage short, very narrow, rounded, thick, fleshy, distant, not half the length of the body.

Siphuncle long, with valve, broad at the base. Eyes lateral, of large size, covered by a continuation of the common integument, and destitute of lachrymal emargination. Head short, medium, not as wide as the body, flattened anteriorly, 5 lines in length; width 7 lines. Neck narrowed. Arms ten, small, compressed, furnished with cupules or suckers, becoming smaller as they approach the tips. The superior pair or dorsal arms are the shortest and smallest, length 6 lines; the second pair similar in shape, more robust, length 10 lines; the third pair very robust, exceeding in length the second pair, length 12 lines; the fourth pair not so robust as the third pair, but of the same length. The tentacular arms, or the fifth pair, slender, flattened at the extremity, length 3 inches, terminating in a point.

Cupules, with ligamentous attachment or foot-stalks, small, rounded, without teeth, and without marginal ring, sphincter-form. The cups are arranged in two rows along the arms, becoming smaller as they approach the tip.

Beak moderately prominent, horny, of a dark brown on the superior and inferior surfaces; the angular membrane surrounding the beak without cupules, though with six short elongations, resembling arms in miniature.

The surface of the body covered with purple points, more especially on the dorsal surface, sparsely on the ventral side of the body, or that on which the funnel is placed.

During the life of the creature, the change of color is very curious, appearing at times to vary its tints according to the surrounding nature of the ground over which it passes. This play of color being very rapid, changing from deep purple to violet and blue, with all their delicate gradations of tint, as far as I have had the opportunity of examining the skin of the *Loliyo*. This phenomenon appears to be due to the contraction and dilatation (pupil-like) of vesicles or globules containing fluids of various colors. This dilatation and contraction, I have noticed, continues for some time after death, although with much less vigor.

The shell or bone is pennate; moderately dilated posteriorly; narrow in front; oblong, with a central keel.

This species is found in the Gulf of Mexico and along the Florida coast, but has not been met with north of the coral reefs.

In the form and position of the fins it is allied to the sepiolæ. It differs from Lesueur's *brevipinna* in the general figure of the body, in the position and size of the fins, in the figure and character of the cupules, in the shape of the shell or bone,—it being narrower. There is but a slight, if any cartilaginous or membranous internal support, with the exception of the shell.

OCTOPUS FILOSA, Howell. Plate 14.

Description.—Body large, oval, purse-shaped, longer than broad, cartilaginous, rounded at the base; surface smooth, with dorsal beards; aperture of sac large.

Length of head and body $1\frac{1}{2}$ inch; diameter 10 lines.

Head narrow, with a depression between the eyes, short, smooth; ocular beards six. Eyes very prominent, covered with a very thin membrane, eyelids four, iris silvery, pupil narrow, dark blue.

Nape of neck or medial fleshy band narrow. Siphonal tube elongate, truncate; no valve or superior bands. Length of siphon 8 lines.

Arms moderately compressed laterally, robust for about half their length, becoming abruptly attenuated.

Length of stout portion of dorsal pair of arms, 1 inch 10 lines; of the filament of the arms, 2 inches 2 lines; length of stout portion of second pair of arms, $2\frac{1}{2}$ inches; of second pair of filaments, $3\frac{1}{2}$ inches; of stout portion of third pair, 3 inches; of

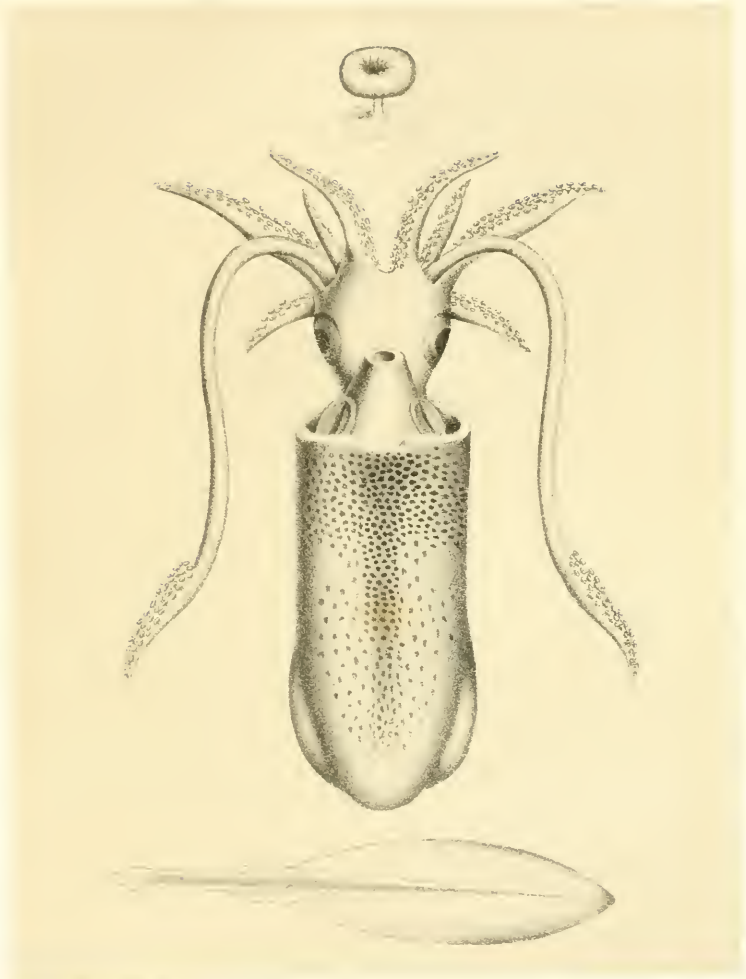
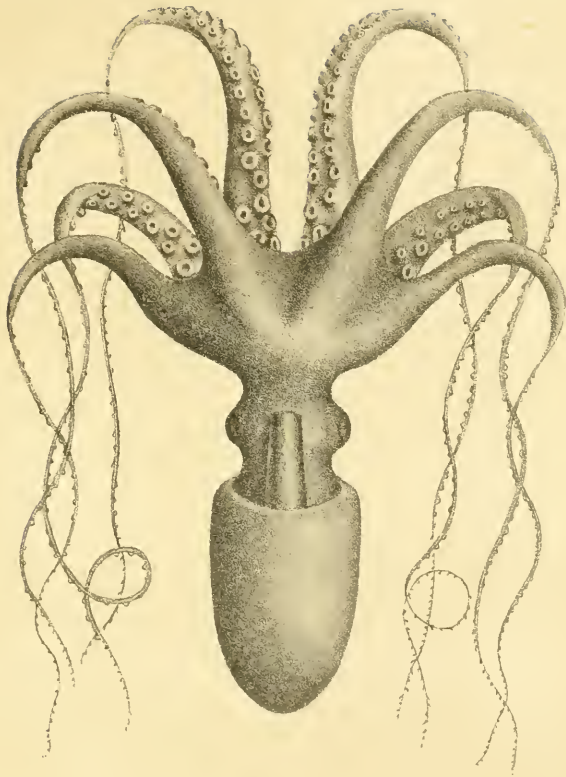


Fig. 1. Lateral view.

Edwards & Co. Lith. Philad.

Loligo hemiplera Howell.



Drawn by E. J. Nolan, M.D.

Bowen & Co. Lith. Philada.

Octopus filosa, Howell.

third pair of filaments, $3\frac{1}{2}$ inches ; fourth or ventral pair of arms the same dimensions as the third.

Web of medium breadth. Mouth very small, not entirely concealing the beak. Cupules sessile, large, with cartilaginous ring, not crowded, in two regular rows. The number of cupules nearest the mouth in a single line are unequal on the different arms. On the dorsal pair, 5 cups in a single line ; on the right arm of the second pair, 8 cups ; left arm, 4 cups ; on the third pair of arms, 7 cups in a single line ; on the ventral pair, 3 cupules.

On the filamentous portion of the arms the cupules are in a single row at regular intervals apart, distinct quite to the tips of the arms.

Color reddish ; around the mouth and the inner surface of the arms white, approaching a cream color. It changes the color of its spots with great rapidity.

Found along the coast of Santa Cruz Island. Very active ; caught with difficulty.

The above description is from the largest specimen of the species that I have seen. This animal is remarkable for the long and thread-like terminations to the arms ; in no other described species have I met with this peculiar tentacular formation.

NOTICES AND REVIEWS OF NEW WORKS.

BY GEORGE W. TRYON, JR.

I.—AMERICAN.

Annals of the Lyceum of Natural History of New York. VIII., Nos. 13, 14. October—December, 1866.

Remarks on some Species of West Indian Marine Shells in the Cabinet of Amherst College, Mass. By HENRY KREBS, of St. Thomas, W. I.

This paper is principally a critique on the species of Jamaica marine shells, named by the late Prof. C. B. Adams.

American Journal of Science and Arts. XLIV., No. 130. July, 1867.

On the Classification of the subdivisions of McCoy's Genus Athyris, as determined by the laws of zoological nomenclature. By E. BILLINGS.

Memols read before the Boston Society of Natural History. Vol. I., part 2. Boston, 1867.

On the Parallelism between the different stages of Life in the Individual and those in the entire Group of the Molluscous order Tetrabranchiata. By ALPHEUS HYATT.

Observations on the Glacial Phenomena of Labrador and Maine, with a View of the recent invertebrate Fauna of Labrador. By A. S. PACKARD, Jr., M. D.

The following recent species are new:—

Margarita campanulata, Morse.

Fusus Syrtensis.

American Naturalist. Published by the Essex Institute, Salem, Mass. 1867.

The first six monthly numbers of this valuable new popular

magazine of Natural History are before us, and contain a paper on the "Land Shells of New England," from the experienced pen and pencil of Mr. Edw. S. Morse. The illustrations are excellent. There is also, in the sixth number, a paper "On the Preparation of Snails' Tongues for the Microscope," by E. S. Morse.

Repertorio Fisico-Natural de la Isla de Cuba. Conducted by F. POEY.
Vol. 2, No. 4. March, 1867.

Conspectus Molluscorum Terrestrium et Fluviatilium Insulae Cubaë. By RAPHAEL ARANGO.

A very complete list of Cuban species. (See a paper on the "Synonymy of Cuban Shells," by the same author, noticed p. 198 of *this Journal*.)

II.—FOREIGN.

BRITISH.

Catalogue of the Specimens of the Australian Land Shells in the Collection of James C. Cox, M. D. 16mo., 50pp. Sidney. 1864.
(From the Author.)

The following new species are described :

<i>Helix Blomfieldi.</i>	<i>Helix Murphyi.</i>
" <i>Mitchellæ.</i>	" <i>livata.</i>
" <i>Mastersi.</i>	" <i>Marice.</i>
" <i>Stroudensis.</i>	" <i>assimilans.</i>
" <i>marmorata.</i>	" <i>umbraculorum.</i>
" <i>Strangeoides.</i>	" <i>Graftonensis.</i>
" <i>Parramattensis.</i>	<i>Bulimus Walli.</i>
" <i>Lyndhurstensis.</i>	" <i>Onslowi.</i>
" <i>microscopica.</i>	" <i>Jacksonensis.</i>
" <i>conoidea.</i>	<i>Succinea Nortoni.</i>
" <i>paradoxa.</i>	" <i>Macgillivrayi.</i>
" <i>Krefftii.</i>	" <i>rhodostoma.</i>
" <i>Belli.</i>	" <i>Eucalypti.</i>
" <i>Morti.</i>	<i>Pupa Kingi.</i>
" <i>Leichardti.</i>	" <i>Ramsayi.</i>
" <i>Saturni.</i>	" <i>Nelsoni.</i>
" <i>Alexandrae.</i>	" <i>Mastersi.</i>
" <i>Scottii.</i>	<i>Pupina Wilcoxi.</i>
" <i>Mac Leayi.</i>	<i>Pupinella MacGillivrayi.</i>
" <i>cerea.</i>	" <i>Whartoni.</i>
" <i>Sydneyensis.</i>	<i>Helicina Gladstonensis.</i>

The following remarks are made respecting synonymy, etc. :

Helix Jervisensis is probably a local variety of *H. Grayi*, and *H. lesa* and *Mastersi* are intermediate between, and varieties of *Jervisensis* and *Grayi*.

Helix ptychomphala, Pfr. Reeve's figure, Conch. Icon., sp. 76, does not represent this shell.

Helix capillacea, Fer. = probably *H. brevipila*.

Bulinus trilineatus, Quoy. Reeve's figures 310 and 397, Conch. Icon. "I would suggest that this (fig. 397) be changed to *Quoyi*; but are they not the same species, and both, as Pfeiffer suggests, only varieties of *B. Kingii* of Gray?" The name *Quoyi* has already been used by Pfeiffer.

Contributions to a Natural History of the Teredidae. By Prof. E. PERCIVAL WRIGHT. (Linnean Transactions, London. Vol. 25.)

Prof. Wright suggests that probably I was premature in making a subfamily Kuphinæ for Teredæ "without valves, clavately cylindrical, sunk horizontally in sand, never penetrating timber, because Dr. J. E. Gray supposes that two large alcoholic specimens received by him, with pallettes resembling those of *Kuphus* and valves attached, but without tubes, are probably the *K. arenarius*." The question must still remain unsettled. If I generalized on insufficient data, the evidence to the contrary of my conclusion as to the non-existence of valves is still less satisfactory.

Mr. Wright believes *Teredo Furcelloides* (even Dr. Gray hesitates to assert positively that his alcoholic specimens are *Kuphe* = *Furcella*.) Gray = and is a synonym of *Calobates thoracites*, Gould.

The following new species are published and illustrated:

Calobates Australis, Western Australia.

I can discover no distinctive characters to separate this from *C. thoracites*.

Kuphus? Manni, Singapore. (= *Calobates*?)

Nausitoria Saulii, Australia.

The genus *Nausitoria* was instituted by Dr. Wright, (Linn. Trans. Vol. 24, 1864,) for a curious fresh water *Teredo* from Comer River, a branch of the Ganges, British India. The generic characters were founded on the non-development of the auricle of the valves. In a review of Dr. Wright's paper (Am. Jour. Conch. II., 165) I doubted whether this would prove to be a permanent character, as only two specimens were examined, and I had frequently seen valves of *Teredos* with the auricle not developed. In describing the second species, *which has slightly developed auricles*, Dr. W. modifies his generic characters and

finds them on the structure of the palettes. The palettes of *N. Saulii* resemble very closely those of the genus *Xylotrya*; while those of *N. Dunlopei* are very much like those of an old *Teredo*, like a large *Norvagica* for example.

Annals and Magazines of Natural History. 3d series. London.

No. 110. FEBRUARY, 1867.

Description of a new Madeiran Pupa. By R. T. LOWE.

Pupa (Alveurella) Wollastoni, Lowe.

Remarks on the History of Dreissena polymorpha. By Dr. OTTO A. L. MÖRCH.

No. 111. MARCH, 1867.

Description of a new Fresh water Bivalve found in Trinidad.

By R. J. LECHMERE GUPPY.

Cyclas punctifera, Guppy.

No. 112. APRIL, 1867.

Description of a new Land Shell from Trinidad. By R. J. LECHMERE GUPPY.

Helicina lamellosa.

A new sub-genus *Perenna* is characterized for this species. "Operculum thin, sub-oval, concentrically striate; nucleus sub-central. Shell like *Helicina*, depressed; whorls lirate and carinate. Animal like *Helicina*."

No. 113. MAY, 1867.

On the Genus Plectostoma, H. Adams, and on the Animal of *Diplommatina*, Benson. By WM. T. BLANFORD.

Plectostoma is surmised to be identical, or at most only sub-generically different from *Opisthostoma*.

No. 114. JUNE, 1867.

Description of some Indian and Burmese Species of Assiminea. By WM. T. BLANFORD.

The genus *Optedicros*, Leith, is claimed to be identical with *Assiminea*. Leith's species are re-characterized also:

A. rotunda, Fairbank, MS. *A. rubella*, Blanford.

Description of a new Species of Rissoa from Maderia. By J. GWYN JEFFREYS.

R. picta.

Conchologia Iconica. By LOVELL REEVE. Parts 260, 261.

Unio, plates 47 to 54. November, 1866.

Sp. 254. *Unio Hainesianus*, Lea, may be that species, but certainly does not come from "Little Arkansas." The correct locality is Siam.

Sp. 257. *Unio leptodon*, Rafinesque = *U. velum*, Say, and *U. tenuissimus*, Lea.

Sp. 258. *Unio semiquadrata*, Sowerby. This species, herein first described, appears to be only the young state of *U. Hainesianus*. It is undoubtedly only a young shell.

Sp. 260. *Unio Housei*, Lea. "Georgia, in America." This figure does not represent *Housei*, which inhabits Siam, and is described in "Observations," VI., p. 11, t. 23, f. 3, and not in vol. 2, p. 71, t. 22, f. 69, as quoted by Sowerby. The figure looks like a *Dipsas plicatus*.

Sp. 262. *Unio crispisulcatus*, is described by Benson; Sowerby has the authority. "Lea MSS."

Sp. 264. *U. Cumingii* is wrong in identification, locality and reference. It is a Chinese species, described by Mr. Lea. Obs. VII. p. 58, t. 35, f. 120. Mr. Sowerby's reference is VI., p. 9, t. 21, f. 1. "Uphanpec Creek, Ala." This is also a *Dipsas plicatus*.

Species 265. *U. Myersianus*, Lea. The reference should be p. 10, t. 22, f. 2, instead of p. 9, t. 21, f. 1, and the shell figured is certainly American, and not Siamese.

Species 266. *U. complanatus* is not an *Unio*, but a *Margaritana*. Mr. Barnes' description is accessible to English naturalists (Am. Jour. Science, 1817) and therefore there is no excuse for quoting "*Barnes*, Lea on *Unio*, &c."

Sp. 267. *U. marginatus*, Lea, is *Margaritana marginata*, Say. The authority quoted would be rather difficult to consult, because the description was never published by Lea. The *Mya rugulosa* of Wood, quoted as a synonym, is a very different shell belonging to the pustulose section of *Unios*.

Sp. 258. *U. Von Buschea* should be *U. Vondem Buschiana*.

Sp. 277. *U. percoarctatus*, Lea, MS. *Hab.* —? The locality is North Carolina.

Sp. 278. *M. Conradicus*, Lea. The locality is Tennessee.

Sp. 280. *U. plicatus*. The authority given is "Say, Encyclopædia Americana." The species is a *Dipsas plicatus* from China, and Mr. Sowerby has confounded it with *Unio plicatus* Lesueur, described by Say in Nicholson's Encyclopædia.

Tellina, plates 10—18; August, 1866.

The following is new :

Tellina Melo, Malaga.

Conchologia Iconica. Parts 262, 263.

Tellina. Plates 19 to 26. March, 1867.

The following we suppose are new :

- T. inflata*, Sowerby, Hab. —? *T. longirostrata*, Sowb. Hab. —?
 “ *caseus*, “ “ “ *Malaccana*, “ Malacca.
 “ *arcuata*, “ Jamaica. “ *corbis*, “ —?
 “ *occidentalis*, Möreh, W. Ind. “ *tenistriata*, “ —?
 “ *tumida*, Sowerby, Jamaica. “ *gracilis*, “ Australia.
 “ *M' Andrei*, “ Madeira. “ *excavata*, “ —?
T. inaequalis, Sowb., Moreton Bay, Australia.

Anodon. Plates 2 to 9. April, 1867.

Sp. 4. *A. rostratus*, the author's name is Kokeil, not Rokiell, and the shell is figured in Rossmassler's Iconog.

A. herculeus, Gertsford? Hab. —? The author's name referred to is correctly Gersfeldt, who in a work on the Mollusca of the Amoor country, describes it, but the real author is Midendorff, who described and figured it years previously.

Sp. 8. *A. hians*, Sowerby. Hab. —?

Sp. 11. *A. suborbiculatus*, Say. Loc. Tennessee, instead of “River Oregon.”

Sp. 14. *A. subsinuatus*, Sowb. Hab. —?

Sp. 15. *A. Gesneri*, Lea, does not = *cataractus*, Say.

Sp. 18. *A. Pallegoixi*, Cuming. Siam.

Sp. 20. *A. complanatus*, Ziegler. Fox River? This is scarcely an American species.

FRENCH.

Faune Conchyliologique Marine du Departement de la Gironde et des Cotes du sud-ouest de la France. By Dr. PAUL FISCHER. (Extracted from the Acts of the Linnean Society of Bordeaux, xxv. pt. 4.) 8vo, 88 pp. Paris, 1865.

This valuable little work contains the following chapters :

1. A description of the *littoral* of the Gironde.
2. History of the production of Oysters in that department. Decadence of the parcs (years 300 to 1854).
3. Replenishment of the Oyster beds. Present state of the oyster fishery (1854–65).

4. On the enemies of the Oyster and their ravages.
5. Oyster-culture in the Charente-inférieure.
6. On Mussels (*Mytilus*) and their culture.
7. On the introduction of exotic mollusks into the basin of Arcachon.

Among the species thus introduced and thriving are *Venus mercenaria*, *Ostrea Virginica*.

8. On other species of edible mollusks of the Gironde.
9. Catalogue of Marine Mollusks.
10. Geographical Distribution.

Journal de Conchyliologie. Edited by Messrs. Crosse and Fischer. Third Series, Vol. VII, No. 2. Paris, April, 1867.

Note sur un genre intermédiaire entre les Ascidiens et les Mollusques lamellibranches. By H. CROSSE.

The genus indicated by the title of this paper is *Rhodosoma*, Ehrenberg, 1828 = *Schizaseus*, Stimpson, Proc. Philada. Acad. 1855. A list of the species and their bibliography is given.

Sur le byssus du Peeten varius. By P. FISCHER.

Note sur le Dreissena fluviatilis, Pallas. By JULES MABILLE.

Quelques mots sur l'acclimatation des Dreissena en France.
By P. FISCHER.

Note complémentaire sur l'Helix Celebensis, Pfeiffer. By M. SOUVERBIE.

Catalogue des Mollusques testacés marins des côtes de l'Espagne et des îles Baléares. By Dr. J. GONZALES HIDALGO.

Note complémentaire sur le Pisidium Watsoni et l'Helix Luseana, de Madère. By the Baron DO CASTELLO DE PAIVA.

Description d'un genre nouveau et de plusieurs espèces inédites provenant de la Nouvelle-Calédonie. By H. CROSSE.

Marginella Mariei, *Geostilbia Caledonica*,
Diplommatina Mariei, *Bulimus Mariei*, Crosse & Fischer.
Hydrocena coturnix, " *pseudocaledonicus*, Montrouzier.
Geostilbia, n. g., allied to *Cæcilianella*.

Description d'une nouvelle espèce de Kellia des mers d'Europe. By P. FISCHER.

Kellia Mac-Andrewi, North coast of Spain.

Descriptions d'espèces nouvelles. By H. CROSSE.

Voluta Tissotiana, Hab.—? *Cylindrella Swiftiana*, Hab.—?
Bulimus Mabiliei, Columbia, *Streptaxis Deshayesianus*, "
Helix Xanthochroa, Hab.—? " *decipiens*, Chili.

Description d'espèces nouvelles de Cochin-Chine. By H. CROSSE.

Cyclophorus Annamiticus, *Cyclotus Gassiesianus*,
Helix Saigonensis.

Diagnose d'une espèce nouvelle d'Helix. By J. G. HIDALGO.
Helix Cardonæ, Minorca.

Diagnoses Molluscorum novorum. By H. CROSSE.

Helix Bigoti, Ins. Mayotte. *Helix Mariei*, N. Caledonia.

Journal de Conchyliologie. Conducted by Messrs. Crosse & Fischer. Third Series. Vol. VII., No. 3. July, 1867.

A fine number of this most excellent journal, containing 134 pages and 4 plates. The following is its very attractive bill of fare:

Anatomie de deux mollusques pulmonés terrestres appartenant aux genres Xanthonyx et Hyalimax. By P. FISCHER.

Note sur le nouveau genre Xanthonyx et Catalogue des espèces qu'il comprend. By H. CROSSE and P. FISCHER.

This genus has for its type *Vitrina Sumichrasti*, Brot.; *V. Salleanus* and *Cordovanus*, Pfr., also belong to it.

Observations sur le Catalogue des Coquilles Marines des côtes de l'Espagne et des îles Baléares de M. Hidalgo. By J. GWYN JEFFREYS.

Abrégé de l'histoire de la classification moderne des Mollusques basée principalement sur l'armature linguale. By O. A. L. MÖRCH.

This important paper by our distinguished contributor we will present to our readers in a translation at some future time, if we can spare the necessary space without curtailing our original articles; we will not therefore review it at present.

Catalogue des Mollusques testacés marins des côtes de l'Espagne et les îles Baléares—(continued). By Dr. JOAQUIN GONZALEZ HIDALGO.

Réponse à une observation de M. Mörch sur le Valvata Jelskii. By H. CROSSE.

In this paper Mr. Crosse defends the validity of his species, which Dr. Mörch (this Journal, p. 106) states to be the embryonic state of a *Lithoglyphus*.

Observations sur quelques Mollusques de la Nouvelle-Calédonie. By E. MARIE.

No new species are described.

Note sur le Syndosmya segmentum. By P. FISCHER.

Description d'espèces nouvelles des Archipels Samoa et Viti.
By H. CROSSE.

Mitra Graëffi, Erato Schmeltziana,
Leiostraca Samoensis.

Diagnose du nouveau genre Méditerranéen Gyriscus. By
N. TIBERI.

Gyriscus Jeffreysianus.

Description d'une espèce nouvelle des îles Chusan. By P.
FISCHER.

Mathilda Sinensis.

Description d'espèces nouvelles. By Dr. J. GONZALEZ HIDALGO.

<i>Cyclotus Fischeri,</i>	Republic of Equador.
<i>Psammobia Pazi,</i>	Hab.—?
<i>Helix Equatoriana,</i>	Equador.

Description d'une espèce nouvelle d'Helix de l'île de Corse.
By O. DEBEAUX.

Helix Revelierei.

Eclaircissements sur une question d'antériorité relative à l'Helix Revelierei. By H. CROSSE and P. FISCHER.

This name is proven to have twenty-two days' priority over *H. Cyniaca*, Dutailly, published for the same species.

Description d'un genre nouveau et de plusieurs espèces inédites provenant de la Nouvelle Calédonie. By H. CROSSE.

<i>Helix Mariei,</i>	<i>Leucorhynchia, n. g.</i>
" <i>Cabriti,</i>	" <i>Caledonica,</i>
<i>Schismope Ferriezi.</i>	

Description de deux espèces fossiles du genre Neritina. By
O. SEMPER.

Neritina Mayeri, Neritina Hörnesana.

Variétés. Promenade malacologique à l'Exposition Universelle de 1867. By H. CROSSE.

Bibliographie. Announcements.

Revue et Magasin de Zoologie. By GUERIN-MÉNEVILLE. 1867. No 3.

Nouvelles Miscellanées Malacologiques. By M. PALADILHE.

<i>Hydrobia Ligurica,</i>	Liguria.
“ <i>Etrusca,</i>	Florence.
“ <i>Macci,</i>	Cannes.
“ <i>Charpyi,</i>	Saint-Amour (Jura).
“ <i>Lusitanica,</i>	Portugal.

Descriptions de quelques espèces nouvelles du groupe de l'Helix Raspaili. By GUSTAVE DUTAILLY.

H. Brocardiana, Corsica. *H. Cynriaca*, Corsica.

“ *Romagnoli,* “

“ *omphalophora,* “

Malacologie du Département de l'Hérault. By PROSPER-ANTOINE MOITESSIER.

No. 4. APRIL, 1867.

Malacologie du Département de l'Hérault (continued). By M. P. A. MOITESSIER.

GERMAN.

Novitates Conchologicæ. Part 1, Land Shells. By Dr. LOUIS PFEIFFER. 26th No. 4to. Cassel, 1867.

This part contains, as usual, three colored plates, illustrating principally recently described species.

Novitates Conchologicæ. Part 2, Marine Shells. By Dr. W. DUNKER. 11th and 12th Nos. 4to. Cassel, 1867.

The following new species and varieties are described and figured:

<i>Barbatia venusta</i> , Dunker.	Hab.—?
“ <i>mollis</i> , “	Ins. Viti.
“ <i>Grayana</i> , “	Pacific Ocean.
<i>Arca angusta</i> , “	Ins. Viti.
“ <i>insignis</i> , “	Hab.—?
<i>Fusciolaria purpurea</i> , Jonas var.	Natal.
“ <i>Andouini</i> , “ “	Red Sea.

Nassa semisulcata, Dunker, in place of *semiplicata*, Zeitsch. f. Malak. 1853, the latter name being preoccupied by Adams.

<i>Fusus tenuiliratus</i> , Dunker.	Hab.—?
“ <i>nodoso-plicatus</i> , “	Japan.
“ <i>Paeteli</i> , “	Hab.—?
<i>Ricinuia speciosa</i> , “	(<i>R. clathrata</i> , Lam., var. B.)

<i>Turritella caelata</i> , Mörch.	Guinea ?
“ <i>dura</i> , “ var.	Realejo.
<i>Fusus pirulatus</i> , Reeve, var.	Van Diemens Land.
<i>Dolium Japonicum</i> , DKr.	Japan.

The illustrations consist of 6 colored plates.

Novitates Conchologicae, Supplement. Monograph of the Genus *Venus*.
Linne. By Dr. EDWARD RÖMER.

The present number contains the conclusion of the *Callistae*, with three colored plates. There are no new species.

Dr. H. G. Bronn's Klassen und Ordnungen des Thier-Reichs, etc.
Fortgesetzt von WM. KEFERSTEIN, M. D. Vol. 3. Malacozoa, 2d Part.
8vo, about 1000 pp. Leipzig and Heidelberg, 1866. Illustrated by 92
lithographic plates and 102 wood cuts.

This is one of the best, if not the very best compendium of Conchology ever published, and as such we earnestly commend it to the patronage of our subscribers. The amount and variety of information upon the subject here gathered together is extraordinary, and reflects great credit on the assiduity and learning of its author and compiler.

Zeitschrift für die Gesammten Naturwissenschaften. Herausg. v. d. Naturw. Vereine für Sachsen und Thüringer in Halle. Edited by C. GIEBEL und M. SIEWERT. 8vo. Berlin, 1866.

Formenreihe für Helix nemoralis, L., und *H. hortensis*, Müll., und deren graphische Darstellung. By P. H. BRUHIN.

Memoires de l'Academie Impériale des Sciences de St. Petersburg.
X. No. 8. 1866.

Ueber Geschlechtsorgane und entwicklung von Ancyclus fluviatilis. By PAUL STEPANOF.

OBITUARY.

JOSHUA ALDER.

This veteran Conchologist died on January 21st, 1867. He was the author of numerous papers upon the Mollusca and Zoophytes of Great Britain, including a beautiful and valuable monography on its Nudibranchiate Mollusca, written in conjunction with Mr. Albany Hancock, and published by the Ray Society. Mr. Alder was a most excellent collector, and very much endeared to English naturalists by his unassuming manners and the kindly assistance always afforded to those engaged in pursuits similar to his own.

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CATALOGUE
OF
RECENT MOLLUSCA,
BELONGING TO THE
ORDER PHOLADACEA.

BY GEORGE W. TRYON, JR.

The following Catalogue is compiled principally from a work published by me in 1862, entitled "Monograph of the Order Pholadacea, and other Papers,"* to which the student is referred for full synonymy, descriptions and remarks.

The species published since the issue of this work, have all been included in the present list, and a few changes have been made in nomenclature and synonymy, the result of a more mature consideration of the subject.

One hundred and forty species are admitted as valid, and the synonymy embraces several hundred more.

Family **PHOLADIDÆ**, Carpenter.

Lectures on Mollusca, p. 99, 1861.

Sub-family **PHOLADINÆ**, Tryon.

Proc. Acad. Nat. Sciences, 1862, Monog. 72.

GENUS **PHOLAS**, Linn.

Syst. Nat. 1757.

1. P. costata, Linn. Syst. Nat. p. 1111, 1757.

Chenu, Man. ii. f. 1, 2, 3. Sowerby, Thes. Conch. ii. t. 102, f. 8, 9. Wood, Gen. Conch. t. 15, f. 1, 2. Adams' Genera, t. 89, f. 1. Blainville, Malacol. t. 79, f. 6. Bruguiere, Encyc. Meth. t. 169, f. 1, 2. Chemnitz, Conch. Cab. viii. t. 101, f. 863. Deshayes, Traite Elem. t. 3, f. 10. Favanne, Conch. t. 60, f. 1. Gualtieri, Index

* 8vo, cloth, 127 pp. Price \$2. Bailliere Bros., New York, London and Paris, Publishers.

Test. t. 105, f. 9. Mawe, Conch., t. 1, f. 4. Lister, Hist. t. 434, f. 277. Reeve, Conch. Syst. t. 23. Wood, Index Test. t. 2, f. 4. Wyatt, Conch. t. 3, f. 4.

United States, W. Indies.

Sub-genus CYRTOPLEURA, Tryon.

Proc. Acad. Nat. Sciences, 1862, Monog. 73.

2. P. crucifera, Sowerby, Zool. Proc. p. 69, 1834.

Chenu, Man. ii. f. 5. Sowerby, Thes. Conch. ii. t. 104, f. 24—26. Philippi, Monog. t. 2, f. 4.

W. Indies? Panama.

3. P. latissima, Sowerby, Zool. Proc. p. 162, 1849.

Chenu, Man. ii. f. 4, 6. Sowerby, Thes. Conch. ii. t. 103, f. 15, 16. Philippi, Monog. t. 2, f. 1.

P. Patula, Gould, Boston Proc. p. 214, 1850. Moll. U. S. Expl. Exped. p. 384. *Manilla.*

4. P. truncata, Say, Jour. Philad. Acad. ii. p. 321, 1822.

Dekay, Moll. N. York, t. 34, f. 223. Hanley, Desc. Cat. t. 9, f. 56. Sowerby, Thes. Conch. ii. t. 104, f. 29, 30.

Coast United States.

GENUS **DACTYLINA**, Gray.

Proc. Zool. Soc. p. 187, 1847.

1. D. dactylus, Linn., Syst. Nat. p. 1110, 1758.

Forbes & Hanley, Brit. Moll. i. p. 108, t. 3, and other British Authors. Sowerby, Thes. Conch. ii. t. 102, f. 10, 11, t. 105, f. 47. Argenville, Conchyl. t. 3, f. k, m. Bonanni, Recreatio pt. 2, f. 25, 26. Born, Test. t. 1, f. 7. Bosc. Hist. des Coq. ii. t. 5, f. 1—3. Brookes Conch. t. 1, f. 7, 8. Bruguiere, Encyc. Meth. t. 168, f. 2.—4. Chemnitz, Conch. Cab. viii. t. 101, f. 857. Chenu, Encyc. Nat. Hist. Moll. t. 33, f. 4, 5. Deshayes, Expl. Sci. Algerie, t. 9, f. 1—3. Favanne, Conchyl. t. 60, f. a 1. Gualtieri, Test. t. 105, f. D. Herbst, Einleit. i. t. 26, f. 1. Lister, Conch. t. 433, f. 276. Mawe Conch. t. 3, f. 3. Murray, Fund. Test. t. 2, f. 10. Poli, Test. Sicil. i. t. 7, f. 1—11. Reeve, Conch. Syst. t. 24. Reichenbach, Conchyl. t. 725, 726. Seba, Mus. iii. t. 16, f. 6. Sowerby, Genera, *Pholas*, f. 1. Wood, Gen. Conch. t. 13, f. 1—3. Wood, Index Test. t. 2, f. 1. Woodward, Man. f. 22. Wyatt, Conch. t. 3, f. 3. Gray, Figs. Moll. Anim. t. 237, f. 4, t. 238, f. 7. Adams' Genera, t. 89, f. 2. Chenu, Man. Conch. ii. f. 10, 11, 13.

Pholas callosa, Lamarek, Anim. sans Vert. v. p. 445, 1818.

Crouch's Cuvier, t. 113. f. 1.

Pholas hians, Pultney, Dorsetshire Catalogue p. 26, 1799.

Pholas muricata, DaCosta, Brit. Conch. p. 244, t. 16, f. 2.
1778. Europe.

Sub-genus GITOCENTRUM, Tryon.

Proc. Philad. Acad., Monog. 76.

2. D. Campechensis, Gmelin, Syst. Nat. p. 3216, 1790.

Hanley, Desc. Cat. t. 9, f. 44. Lister, Hist. Conch. t. 432.

Pholas oblongata, Say, Jour. Phil. Acad. ii. 320, 1822.

Pholas Candeara, D'Orbigny, Moll. Sagra's Cuba, 215, t. 25,
f. 18, 19. Southern United States, W. Indies.

3. D. Chiloensis, King., Zool. Jour. v. 334, 1832.

Sowerby, Thes. Conch. ii. t. 102, f. 1, 2. Philippi, iii. t. 1,
f. 4, 5. Chenu, Man. ii. f. 14, 15.

Pholas laqueata, Sowerby, Proc. Zool. Soc. 1849. Thes.
Conch. ii. 486, t. 103, f. 19, 20.

Dactylina retifer, Mörch, Mal. Blätter vii. 177, 1860.

Peru, Chili.

GENUS **MONOTHYRA**, Tryon.

Proc. Philad. Acad. 1862, Monog. 77.

1. M. orientalis, Gmelin, Syst. Nat. p. 3216.

Sowerby, Thes. Conch. ii. 486, t. 102, f. 3, 4. Wood, Gen.
Conch. t. 14, f. 1, 2. Bruguiere, Encyc. Meth. t. 168,
f. 10. Chemnitz, Conch. Cab. viii. t. 101, f. 860. Han-
ley, Desc. Cat. t. 2, f. 20. Lister, Hist. Conch. t. 431,
f. 247. Wood, Index Test. t. 2, f. 1. Chenu, Manual,
ii. f. 16.

Pholas Siamensis, Spengler.

Pholas dactylus, Solander, MSS. teste Gray, Ann. and Mag.
Nat. Hist. 2 ser. viii. 382. India.

GENUS **XYLOPHAGA**, Turton.

Conch. dithyra Brit. 253, 1822.

1. X. cardissa, Gould, Otia Conchologica, 241, 1862.

Mergive Islands.

2. X. dorsalis, Turton, Conch. dith. Brit. 253, t. 2, f. 4, 5,
1822.

Chenu, Man. ii. f. 20, 21. Sowerby, t. 108, f. 103, 104.

Forbes & Hanley, t. 2, f. 3, 4, and British Authors.

Adams' Genera, t. 89, f. 4. Chenu, Encyc. Hist. Nat. Moll. f. 241—4. Reeve, Conch. Syst. t. 22.
Pholas xylophaga, Deshayes, Anim. s. Vert. vi. 47, 1835.
 England.

3. X. globosa, Sowerby, Zool. Proc. 110, 1835.

Sowerby, Thes. ii. t. 108, f. 101, 102. Chenu, Man. ii. f. 22, 23.

Pholas gibbosa, D'Orbigny, Voy. Am. Merid. 501. Chili.

GENUS **TALONA**, Gray.

Synopsis Brit. Mus. 1840.

1. T. explanata, Spengler, Skrivt. Nat. ii. pt. i. 1791.

H. & A. Adams, iii. t. 9, f. 2, 2a.

Pholas clausus, Gray, Bowdich's Elem. 1822. Sowerby, Thes. ii. t. 107, f. 74, 75. Hanley, Desc. Cat. t. 11, f. 8. Chenu, Man. ii. f. 34, 35.

Pholas candidus, Chemnitz, Conch. Cab. viii. f. 862, 1785.
 W. Africa.

GENUS **BARNEA**, Leach.

Risso, Hist. Nat. Europ. Merid. iv. f. 376. 1826.

1. B. Australasiæ, Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. 381.

Sowerby, Thes. Conch. ii. t. 106, f. 73. Australia.

2. B. Burmanica, Philippi, Neuer Conchyl. iii. Pholas. t. 1, f. 1.

Pholas Bakeri, Deshayes, Woodward's Manual, t. 23, f. 19.
 Burmah.

3. B. candida, Linn., Syst. Nat. p. 1111.

Sowerby, Thes. ii. t. 103, f. 21—23. Wood, Gen. Conch. t. 14, f. 3, 4. Forbes and Hanley, t. 4, f. 1, 2, and British Authors. Bruguiere, Encyc. Meth. t. 168, f. 11. Burrow, Elem. t. 3, f. 4. Chemnitz, Conch. Cab. viii. t. 101, f. 861. Crouch, Introd. Lamarek, t. 2, f. 11. Deshayes Expl. Algeriæ, t. 9, f. 4, 5. Deshayes, Traite Elem. t. 3, f. 13, 14. Gualtiere, Test. t. 105, f. 8. Hanley, Desc. Cat. t. 2, f. 3. Mawe, Conch. t. 3, f. 2. Poli, Test. Sicil. t. 7, f. 12, 13. Wood, Index Test. t. 2, f. 3. Wyatt, Conch. t. 3, f. 2. Gray, Figs. Moll. Anim. t. 338. f. 6. Chenu, Man. Conchyl. ii. f. 17, 18.

Pholas dactyloides, Della Chiaje, Mem. iv. t. 65, f. 4.

Pholas papyracea, Spengler, Skrivt. Nat. ii. pt. 1, t. 1, f. 4, 1791.

Pholas Silicula, Deshayes, Lamarek, Anim. s. Vert. vi. 45, 1835.
 Europe.

4. **B. Erythræa**, Gray, Ann. and Mag. Nat. Hist. 2 ser. viii. 382, 1851. *Red Sea.*
 5. **B. lanceolata**, D'Orbigny, Voy. Am. Merid. 497, t. 77, f. 18, 19. *Patagonia.*

Sub-genus ANCHOMASA, Leach.

Moll. Gt. Britain, p. 253.

6. **B. Manillensis**, Philippi, Zeit. für Malak. 72, 1847.
 Sowerby, Thes. ii. t. 103, f. 17, 18. Philippi, Neuer Conchyl. iii. Pholas t. 1, f. 2.
Pholas fragilis, Sowerby, Zool. Proc. 161, 1849. Thes. ii. t. 108, f. 92, 93.
Pholas Manilleæ, Sowerby, Zool. Proc. 161, 1849. *Manilla.*
 7. **B. parva**, Pennant, Brit. Zool. iv. 77, t. 49, f. 13, 1777.
 Sowerby, Thes. ii. f. 31, 32. Forbes and Hanley, t. 2, f. 2, t. 4, f. 1, 2, and British authors. Philippi, Neuer Conchyl. t. 2, f. 2. Hanley, Desc. Cat. t. 2, f. 6. Wood, Index Test. t. 2, f. 6. Adams, Gen. t. 89, f. 3. Chenu, Man. ii. f. 19.
Anchomasa Pennantiana, Leach, Moll. Gt. Brit., 253, 1852.
Pholas crenulatus, Spengler, Skrivt. Nat. ii. pt. i. 92, 1792.
Pholas dactylus, var., Deshayes, Lamarck, Anim. s. Vert. vi. 45.
Pholas dactyloides, Lamarck, Anim. s. Vert. v. p. 445, 1818.
Pholas ligamentinus, Deshayes, Traite Elem. 80, t. 1, f. 11, 12.
Pholas tuberculatus, Turton, Conch. dithyra, 5, t. 1, f. 7, 8, 1822. Chenu, Illus. Conchyl. t. 3, f. 3. Wood, Index Test. Suppl. t. 1, f. 3. *England.*
 8. **B. similis**, Gray, In. Yates' New Zealand.
 Sowerby, Thes. ii. t. 103, f. 12—14.
Pholas antipodum, Philippi, Zeitschr. für Malak. 71, 1847. *New Zealand.*

9. **B. subtruncata**, Sowerby, Zool. Proc. 69, 1834.
Pholas lamellosa, D'Orbigny, Voy. Am. Merid. 498, t. 77, f. 20, 21. *Peru, Isle Plata, Patagonia.*

GENUS **NAVEA**, Gray.

Ann. and Mag. Nat. Hist., 2 ser. viii. 385.

1. **N. Newcombii**, Tryon, Am. Jour. Conch. i. 39, 285, t. 2, f. 1—3, 1865. *Lower California.*
 2. **N. nucifera**, Fabricius, Spengler, Skrivt. Nat. iv. 40, t. 10, f. 4. 9, 1798.

3. **N. subglobosa**, Gray, Ann. and Mag. Nat. Hist. 2 ser., viii. 385, 1851.
Chenu, Man, ii. f. 28, 29. H. and A. Adams, iii. t. 89, f. 6. *California*.
4. **N. tenuis**, Gray, Ann. and Mag. Nat. Hist. 2 ser. viii. 385, 1851. —?

GENUS **ZIRPHÆA**, Leach.

H. and A. Adams' Genera, ii.

1. **Z. constricta**, Sowerby, Zool. Proc. 161, 1849.
Sowerby, Thes. Conch. ii. t. 104, f. 27, 28. *Straits of Sunda*.
2. **Z. crispata**, Linn. Syst. Nat. p. 1111.
Sowerby, Thes. ii. t. 104, f. 37. Forbes & Hanley, t. 4, f. 3, 4, 5, and British authors. Bruguiere, Encyc. t. 169, f. 5-7. Chemnitz. Conch. Cab. viii. t. 102, f. 872-874. De Kay, Moll. N. Y. t. 32, f. 306. Wood, Gen. Conch. t. 15, f. 4, 5. Wood, Index Test. t. 2, f. 5. Adams' Genera, t. 89, f. 5. Chenu, Man. ii. f. 26, 27. Gray, Figs' Moll. Anim. t. 338, f. 5, t. 339, f. 5.
Pholas bifrons, Da Costa, Brit. Conch. 242, t. 16, f. 4, 1777.
Solen crispus, Gmelin, Syst. Nat. p. 3228, 1790.
Pholas parva, Da Costa, Brit. Conch. 247, 1777.
Northern Europe and U. S.
3. **Z. Gabbii**, Tryon, Proc. Philad. Acad. May, 1873, t. i, f. 1.
Japan? California.
4. **Z. Julian**, Adanson, Hist. Nat. Senegal, 260, t. 19, f. 1, 1757. *Senegal*.

Sub-family JOUANNETINÆ, Tryon.

Proc. Philad. Acad. 1862, Monog. 84.

GENUS **PHOLADIDEA**, Turton.

Conch. Dict. 147, 1819.

1. **P. ovoidea**, Gould, Boston Proc. vi. 238, t. 15, f. 1.
Lower California.
2. **P. papyracea**, Solander, MSS. Turton, Conch. dithyra, 2, t. 1, f. 4, 1822.
Chenu, Illust. Conch., *Pholas*, t. 3, f. 1. Mawe, Conch. t. 3, f. 5. Philippi, Neuer Conchyl., *Pholas*. t. 2, f. 3. Sowerby, Thes. Conch. ii. t. 106, f. 66. H. and A. Adams, iii. t. 90, f. 1. Chenu, Man, ii. f. 30, 31. Reeve,

Conch. Syst. t. 2, f. 3. Sowerby, Genera Pholas, f. 3.
Wood, Index Test. Suppl. t. 1, f. 3. Forbes & Hanley,
Brit. Moll. t. 5, f. 3—6, and British authors. Wood-
ward, Manual, t. 23, f. 20.

Pholas lamellata, Turton, Conch. dithyra, 4, t. 1, f. 5, 6, 1822.
Chenu, Illust. Conchyl. Pholas, t. 3, f. 2. Wood, Index
Test. Suppl. t. 1, f. 3.

Pholas striata, Blainville, Malacol. t. 8 bis, f. 7, 1825. Grif-
fith's Cuvier, t. 8, f. 1. Henderson's Cuvier, t. 41, f. 1.
Wyatt, Conch. t. 3, f. 5.

Pholadidea Loscombia, Turton, Conch. Dict. 147, 1819.

Pholadidea Goodallii, Blainville, Dict. Sci. Nat. xxxvii. 532,
1826.

Cadmusia Solanderiana, Leach, Moll. Gt. Britain, 254, t. 12,
f. 1, 2. *Europe.*

3. **P. spathulata**, Sowerby, Zool. Proc. 162, 1849.

Sowerby, Thes. Conch. ii. 497, t. 106, f. 69, 70.

New Zealand.

4. **P. sulcata**, Brown, Ill. Conch. Gt. Brit., 115, t. 48, f. 17,
18, 1844. *England.*

Sub-genus TALONELLA, Gray.

Ann. and Mag. Nat. Hist. 2 ser. viii. 385, 1851.

5. **P. tridens**, Gray, Sowerby, Thes. Conch. ii. 498, t. 106, f.
60, 61, 1849. *Monte Christo.*

Sub-genus HATASIA, Gray.

Ann. & Mag. Nat. Hist. 2 ser. viii. 385, 1851.

6. **P. melanura**, Sowerby, Zool. Proc. 70, 1834.

Sowerby, Thes. ii. t. 107, f. 78, 79. Chenu, Man. ii. f. 32, 33.

Penitella Wilsonii, Conrad, Proc. Philad. Acad. 156, 1849.
Jour. Philad. Acad. 2 ser. i. 279, t. 39, f. 4.

Lower California.

7. **P. quadra**, Sowerby, Zool. Proc. 71, 1834. Thes. ii. t.
106, f. 62, 63. *Monte Christo.*

8. **P. tubifera**, Sowerby, Zool. Proc. 71, 1834. Thes. ii. t.
106, f. 64, 65. *Panama.*

Sub-genus NETTASTOMELLA, Carpenter.

Proc. Zool. Soc. London, 1865.

9. **P. Darwinii**, Sowerby, Thes. Conch. ii. 490, t. 107, f. 76, 77.
Chenu, Manuel de Conchyl. ii. f. 39, 40.

Ins. Chiloe, California.

GENUS **PARAPHOLAS**, Conrad.

Proc. Acad. Nat. Sci. Philad. 121, 1848.

1. **P. Californica**, Conrad, Proc. Philad. Acad. 121, 1848.
 Jour. Philad. Acad. vii. 236, t. 18, f. 5.
 Sowerby, Thes. ii. t. 102, f. 6, 7. Hanley, Desc. Cat. t. 9, f. 43.
Pholas Janelli, Deshayes, Zool. Proc. 357, 1839. Guerin's Magazine, t. 14, 15, 16, 1840. Chenu, Illus. Conch., *Pholas*, t. 3, f. 5. Chenu, Man. ii. f. 41, 42. *California*.
2. **P. quadrizonalis**, Spengler, Sowerby, Thes. Conch. ii. 492, t. 108, f. 88, 89.
Pholas Incii, Sowerby, Zool. Proc. 1849. Thes. Conch. ii. 491, t. 105, f. 45, 46. *Torres Straits*.

GENUS **PENITELLA**, Valenciennes.

Voyage Venus, atlas, t. 24.

1. **P. curvata**, Tryon, Am. Jour. Conch. i. 40, t. 2, f. 6—8, 1865. *Sts. of Fuca*.
2. **P. parva**, Tryon, Am. Jour. Conch. i. 39, t. 2, f. 4, 5, 1865. *Lower California*.
3. **P. penita**, Conrad, Jour. Philad. Acad. vii. 237, t. 18, f. 7, 1837.
Pholas concamerata, Deshayes, Rev. Zoologique, 359, 1839. Guerin's Mag. t. 17, 1840. Chenu, Ill. Conch. t. 3, f. 4. Sowerby, Thes. ii. 497, t. 106, f. 67, 68, 1849. Chenu, Man. ii. f. 43, 44.
Pholas cucullata, Gray, Syn. Brit. Mus. 1840.
Penitella Conradi, Valenciennes, Voy. Venus, t. 24, f. 1.
Pholas cornea? Sowerby, Zool. Proc. 12, 1834.

GENUS **JOUANNETIA**, Desmoulins.

Bull. Linn. Soc. Bordeaux, ii. 244.

1. **J. Cumingii**, Sowerby, Zool. Proc. 161, 1849.
 Sowerby, Thes. ii. t. 106, f. 56, 57. Chenu, Man. ii. f. 38. *Philippines*.
2. **J. Duchassaingi**, Deshayes, Fischer, Jour. de Conchyl. 375, t. 15, f. 3, 1862. *Panama*.
3. **J. globosa**, Quoy, Mollusques, Voy. Astrolabe, 549, t. 85, f. 16—18, 1832.
 Sowerby, Thes. ii. t. 106, f. 54, 55. Chenu, Man. ii. f. 36. Gray, Figs. Moll. Anim. t. 338, f. 3. *Philippines*.

4. **J. Vignoni**, Fischer, Jour. de Conchyl. 376, t. 15, f. 4, 1862. *W. Coast Africa.*

Sub-genus PHOLADOPSIS, Conrad.

Proc. Philad. Acad. 156, 1849.

5. **J. pectinata**, Conrad, Jour. Philad. Acad. 2d ser. i. 279, t. 39, f. 3, 1850.

Triumphalia pulcherrima, Sowerby, Zool. Proc. 161, 1849.
Thes. ii. t. 106, f. 58, 59. *California, W. Columbia.*

GENUS **MARTESIA**, Leach.

Blainville, Dict. Sci. Nat. 1824.

1. **M. branchiata**, Gould, Boston Proc. 290, 1849.

Sowerby, Thes. Conch. ii. 493, t. 108, f. 82, 83. *Africa.*

2. **M. calva**, Sowerby, Zool. Proc. 69, 1834.

Sowerby, Thes. t. 105, f. 51—53. Chenu, Man. ii. f. 45—47.

Pholas acuminata, Sowerby, Zool. Proc. 70, 1834. Thes. ii. t. 105, f. 48—50. Hanley, Desc. Cat. t. 9, f. 30. Chenu, Man. ii. f. 56.

Parapholas bisulcata, Conrad, Jour. Philad. Acad. 2d ser. i. t. 39, f. 5, 1850. *California, Mazatlan, Panama.*

3. **M. curta**, Sowerby, Zool. Proc. 71, 1834.

Sowerby, Thes. ii. t. 104, f. 33, 34. Chenu, Man. ii. f. 51. *Panama.*

4. **M. intercalata**, Carpenter, Cat. Mazatlan Shells, p. 13, 1859. *Mazatlan.*

5. **M. multistriata**, Sowerby, Thes. Conch. ii. 494, t. 104, f. 35, 36, 1849. *Australia.*

6. **M. obtecta**, Sowerby, Thes. Conch. ii. 496, t. 108, f. 80, 81, 1849. *Philippines.*

7. **M. ovum**, Gray, Wood's Index, Test. Suppl., f. 4, 1844.

Pholas ovata, Gray, Sowerby, Thes. ii. 493, t. 107, f. 71—72, 1849. *West Indies.*

8. **M. aperta**, Sowerby, Thes. ii. 491, t. 108, f. 99, 100, 1849. *Straits of Sunda.*

9. **M. Australis**, Gray, Ann. and Mag. Nat. Hist., 2d ser., viii. 384, 1851. *N. W. Australia.*

10. **M. corticaria**, Adams, Sowerby, Thes. ii. 495, t. 108, f. 94—96, 1849.

Tryon, Monog., 93, 1862.

Pholas Beauiana, Recluz, Jour. de Conchyl. iv. 49, t. 2, f. 1, 2, 3, 1853.

Pholas Caribæa, D'Orbigny, Moll. Sagra's Cuba, 216, t. 25, f. 20—22, 1853.

Pholas Hornbeckii, D'Orbigny, Moll. Sagra's Cuba, 217, t. 25, f. 23—25, 1853. *West Indies.*

11. *M. cuneiformis*, Say, Jour. Philad. Acad. ii. 322, 1822.
Sowerby, Thes. ii. 495, t. 104, f. 38, 39, t. 108, f. 86, 87.

Pholas Edwardsii, Gray, Syn. Brit. Mus., 1820.

Pholas rudis, Gray, Syn. Brit. Mus., 1820.

Southern United States, West Indies.

12. *M. rivicola*, Sowerby, Thes. ii. 496, t. 108, f. 90, 91, 1849.

Adams and Reeve, Voy. Samarang, 84, t. 23, f. 5.

Pantai River.

13. *M. striata*, Linnæus, Syst. Nat., p. 1111, 1758.

Chemnitz, Conch. Cab. t. 102, f. 867, 868. Gualtieri, Test. t. 105, f. F. Mawe, Conch. t. 3, f. 1. Reeve, Conch. Syst. t. 24, f. 2. Rumpkin's Mus. t. 46, f. 8. Sowerby Genera, *Pholas*, f. 2. Sowerby, Thes. ii. 494, t. 104, f. 40—42. Chenu, Man. ii. f. 48, 50. Wood, Gen. Conch. t. 16, f. 1—4, 8. Wood, Index Test. t. 2, f. 7. Adams, Genera, t. 90, f. 5. Woodward, Manual, t. 23, f. 21, and British Authors.

Pholas pusilla, Linnæus, Syst. Nat. p. 1111, 1758. Donovan, iv. t. 117, 1799.

Pholas clavata, Lam., Anim. s. Vert. v. p. 446, 1818. Encyc. Meth. t. 170, f. 1—3.

Pholas conoides, Fleming, Brit. Anim. 457, 1828.

Pholas lignorum, Spengler, Berl. Ges. Nat. iv.

Pholas nana, Pultney, Dorset. Cat. 27, 1799.

Pholas falcata, Wood, Gen. Conch. t. 16, f. 5—7, 1835.
Index Test. *Pholas*, t. 2, f. 8?

Pholas terediniformis, Sowerby, Thes. ii. 490, t. 108, f. 97, 98, 1849.

Pholas semicostata, Lea, Bost. Proc. t. 24, f. 1, Nov., 1844.
Sowerby, Thes. Conch. ii. t. 108, f. 84, 85.

England, West Indies, Philippine.

GENUS **DIPLOTHYRA**, Tryon.

Proc. Philad. Acad., Sept. 1862, May, 1863.

1. *D. Smithii*, Tryon, Philad. Proc., Sept. 1862.

Tottenville, Staten Island, N. Y.

GENUS **SCHROTERIA**, Tryon.

Philad. Proc., Apr., 1862.

1. **S. cordata**, Schröter, Conch. iii. 544, t. 9, f. 22—24, 1786.
Bruguere, Encyc. Meth. t. 169, f. 8—10. *Loc.—?*

Family **GASTROCHÆNIDÆ**, Tryon.

Philad. Proc., Dec., 1861, Monog. 38.

Sub-family **GASTROCHÆNINÆ**, Tryon.

Philad. Proc., Dec., 1861.

GENUS **GASTROCHÆNA**, Spengler.

Nov. Act. Soc. Sc. Havn. ii. 1780.

Chæna, Retzius, Nov. Test. Genera, 19, 1788.

1. **G. agglutinans**, Deshayes, Proc. Zool. Soc. London, 330, 1854.
Philippines.
2. **G. grandis**, Deshayes, Proc. Zool. Soc. London, 330, 1854.
Philippines.
3. **G. mumia**, Spengler, Nov. Act. Sc. Havn. ii. 174, f. 1—7, 1783.
Deshayes, Traite Elem. 32, t. 2. Adams' Genera, iii. t. 91, f. 1, 1a. Woodward Manual, t. 23, f. 16.
Fistulana clava, Lamarck, Anim. sans Vert. v. 435, 1818.
Cuvier, Regne Anim. Edit. Audouin, t. 116, f. 1. Sowerby Genera, No. 27, f. 1—5. Blainville, Malacol. t. 81, f. 3, 1825. Hanley, Desc. Cat. 3, t. 11, f. 5, 1842.
Reeve, Conch. Syst. t. 19. Wyatt, Conch. t. 33, f. 5.
India, Philippines.

GENUS **ROCELLARIA**, Fleuriau de Bellevue.

Journ. de Phys., 1802.

1. **R. apertissima**, Deshayes, London Zool. Proc. 326, 1854.
Philippines.
2. **R. brevis**, Sowerby, London Zool. Proc. 21, 1834.
Gallapagos Is.
3. **R. cucullata**, Deshayes, London Zool. Proc. 329, 1854.
West Indies.
4. **R. cuneiformis**, Spengler, Nov. Act. Sc. Soc. ii. 179, f. 8—11, 1783.

- Sowerby, Genera, f. 3, 4, 5. Blainville, Man. de Malacol. 574, t. 79, f. 5. Reeve, Conch. Syst. t. 20, f. 4, 5.
Pholas hians, Chemnitz, Conch. Cab. x. 364, t. 172, f. 1678, 1679, 1788. Wood, Index Test., 2d edit., t. 2, f. 11.
Fistulana rupestris, Bosc. Hist. Nat. des Coq. ii. 205, 1824.
West Indies.
5. **R. denticulata**, Deshayes, London Zool. Proc. 327, 1854.
Columbia.
6. **R. dentifera**, Dufo, Ann. des Sc. Nat. 221, 1840.
Seychelles and Admiral Is.
7. **R. difficilis**, Deshayes, London Zool. Proc. 328, 1854.
Western India.
8. **R. dubia**, Pennant, Brit. Zool. iv. 82, t. 44, f. 19, 1777.
 Donovan, Brit. Shells, iii. t. 108. Wood, Gen. Conch. 102, t. 25, f. 2, 3. Wood, Index Test., edit. 2, t. 2, f. 23. Deshayes Traite Elem. i. pt. ii. 34, t. 2, f. 4, 5. Philippi, Wiegmann's Archiv. t. 7, f. 1 Adams' Genera, t. 91, f. 2.
Pholas pusilla, Poli, Test. utr. Sicil. i. 50, t. 7, f. 12, 13, 1791.
Gastrochæna Pholadia, Turton, Conch. Dithyra, 18, t. 2, f. 8, 9, 1822. Brown, Brit. Conch. t. 48, f. 13, 14.
Chama parva, Da Costa, Brit. Conch. 234, 1778.
Pholas faba, Pultney, Dorsetshire Cat. 27, 1779.
Mytilus ambiguus, Dillwynii, 304, 1817.
Gastrochæna hians, Fleming, Brit. Anim. 458, 1828.
Gastrochæna cuneiformis, Philippi, Enum. Moll. Sicil. i. 2, 1836.
Gastrochæna Poliï, Philippi, Enum. Moll. Sicil. ii. 3, 1844.
Gastrochæna modiolina, Lamarck, Anim. s. Vert. v. 447, 1818.
 Sowerby, Genera, f. 1, 2. Sowerby, Conch. Man. f. 52. Crouch, Introd. Lamarck, t. 2, f. 12. Guerin's Magazine, t. 69, 70, 71, 1843. Reeve, Conch. Syst. t. 50, f. 1, 2. Leach, Moll. Gt. Brit. t. 3, f. 3. Forbes and Hanley, Brit. Moll. t. 2, f. 5—8. Woodward, t. 23, f. 15.
England, Mediterranean.
9. **R. humilis**, Deshayes, London Zool. Proc. 327, 1854.
Philippines.
10. **R. hyalina**, Sowerby, London Zool. Proc. 22, 1834.
Lord Hood's I.
11. **R. impressa**, Deshayes, London Zool. Proc. 327, 1854.
Hab.—?

12. *R. indistincta*, Deshayes, London Zool. Proc. 328, 1854.
Singapore.
13. *R. interrupta*, Deshayes, London Zool. Proc. 329, 1854.
Philippines.
14. *R. intersecta*, Deshayes, London Zool. Proc. 327, 1854.
Hab.—?
15. *R. lævigata*, Deshayes, London Zool. Proc. 326, 1854.
Hab.—?
16. *R. lamellosa*, Deshayes, London Zool. Proc. 328, 1854.
Philippines.
17. *R. macroschisma*, Deshayes, London Zool. Proc. 326,
1854. *Hab.—?*
18. *R. ovata*, Sowerby, London Zool. Proc. 21, 1834.
Hanley, Desc. Cat. 10, t. 9, f. 42.
Panama, I. Plata, W. Indies, Charleston, S. C.
19. *R. Philippinensis*, Deshayes, London Zool. Proc. 328,
1854. *Philippines.*
20. *R. pupina*, Deshayes, London Zool. Proc. 326, 1854.
Morton Bay.
21. *R. rugulosa*, Sowerby, London Zool. Proc. 22, 1834.
Gallapagos Is.
22. *R. Rupellii*, Deshayes, London Zool. Proc. 328, 1854.
Red Sea.
23. *R. spathulata*, Deshayes, London Zool. Proc. 329, 1854.
Philippines.
24. *R. Stimpsonii*, Tryon, Proc. Philad. Acad. Dec. 1861.
Beaufort, N. C.
25. *R. tenera*, Deshayes, London Zool. Proc. 327, 1854.
Philippines.

Sub-genus SPENGLERIA, Tryon.
Proc. Philad. Acad. 1861, Monog. 40.

26. *R. Mytiloides*, Lamarck, Anim. sans Vert. v. 447, 1818.
Hanley, Desc. Cat. 10, t. 9, f. 37. Rumphius, Amb. Rar.
t. 45, f. P. *Isle of France.*
27. *R. plicatilis*, Deshayes, London Zool. Proc. 329, 1854.
Philippines.
28. *R. rostrata*, Spengler, Nov. Act. Sc. Soc. ii. 1783.
Gastrochena callosa, Philippi, Wiegmann's Archiv. 1845.
Gastrochena Chemnitziana, D'Orbigny, Moll. Cuba, 229, t.
29, f. 29, 30. *W. Indies.*

29. **R. truncata**, Sowerby, London Zool. Proc. 21, 1834.
Hanley, Desc. Cat. 10, t. 9, f. 40. *Panama, Mazatlan.*

GENUS **CUCURBITULA**, Gould.

Proc. Bost. Soc. Nat. Hist. viii. 22, 1861.

1. **C. cymbia**, Spengler, Nov. Act. Sc. Soc. ii. 1783.
Fistulana lagenula, Lamarck, Anim. sans Vert. v. 436, 1818.
Hanley, Desc. Cat. 3, t. 13, f. 59.
Red Sea, Hong Kong.

Sub-family BRYOPINÆ, Tryon.

Proc. Acad. Nat. Sci. Philad. 1861, Monog. 40.

GENUS **BRYOPA**, Gray.

Syn. Brit. Mus. 1840.

Clavagella, Lamarck (*partim*), Anim. sans Vert. v. 430, 1818.

1. **B. aperta**, Sowerby, Genera of Shells, No. 13, f. 1—4,
1820—24.
Crouch, Introd. to Lamarck, t. 2, f. 7. Deshayes, Expl.
de l'Algerie, 15, t. 1, f. 1. Adams' Genera, iii. t. 91,
f. 3. Gray, Figures Moll. Animals, v. t. 340, f. 6—8.
Cuvier, Audouin's Edit. Mollusca, t. 117, f. 2. Reeve,
Conch. Syst. t. 18. Cailleaud, Guerin's Mag. t. 49—51,
1842. Chenu, Illust. Conch. *Clavagella*, t. 1, f. 3—6.
Clavagella vivens ? Rang, Man. Moll. 342, 1829.
Clavagella sicula, Della Chiaje, Memorie, t. 83, f. 19, 23, t.
84, f. 18, 22, 23. *Mediterranean Sea.*
2. **B. lata**, Broderip, Zool. Proc. iii. 1834.
Broderip, Zool. Trans. i. t. 30, f. 8—10. Owen, Zool.
Trans. i. t. 3, f. 11—16. Hanley, Desc. Cat. t. 11, f. 4.
Deshayes, Traite Elem. t. i. f. 12—14. Chenu, Illust.
Conch. t. 3, f. 7. *Indian and Pacific Ocean.*
3. **B. Melitensis**, Broderip, Zool. Proc. 116, 1834.
Broderip, Zool. Trans. i. t. 35, f. 5—8. Cuvier, Audouin's
Edit. t. 117, f. 1. Hanley, Desc. Cat. t. 11, f. 3. Gue-
rin's Mag. Zool. t. 50, f. 4. Chenu, Illust. Conch. t. 1,
f. 5, t. 3, f. 1—6. Deshayes, Expl. de l'Algerie, t. 1,
f. 2. Gray, Figures Moll. Anim. v. t. 340, f. 9, t. 341,
f. 1.
Clavagella angulata, Philippi, Enum. Moll. Sicil. ii. 2, t. 13,
f. 3, 1844. *Greece to Sicily.*

Sub-genus DACOSTA, Gray.

London Zool. Proc. 315, 1858.

4. **B. Australis**, Sowerby, Appendix Stutchbury Cat. t. 1, f. 1.
Hanley, Desc. Cat. t. 9, f. 22. Adams' Genera, iii. t. 91.
Clavagella elongata, Broderip, Zool. Trans. i. 265, t. 35, f. 1—4,
1835. Hanley, Desc. Cat. t. 11, f. 1, 2. Guerin's Mag.
t. 50, f. 3. Chenu, Illust. Conch. *Clavagella*, t. 1, f. 4.
Pacific Ocean.
5. **B. balanorum**, Scacchi, Philippi in Weigman's Archives, i.
181, t. 3, f. 1—6, 1840.
Cailliaud, Guerin's Mag. t. 52, f. 1—5. Chenu, Illust.
Conch. t. 1, f. 7. Hanley, Desc. Cat. t. 10, f. 21. Phil-
ippi, Enum. Moll. Sicil. t. 13, f. 2. Gray's Figures Moll.
Anim. v. t. 340, f. 1—5. *Naples*.

Sub-family PENICILLINÆ, Gray.

GENUS **BRECHITES**, Guettard.

Mem. de l'Academie Paris, ii. 18, 1774.

Aspergillum, Bruguiere, Encyc. Meth. 1789.

1. **B. annulus**, Deshayes, Reeve Monog. *Asperg.* t. 1, f. 1,
1860. *Singapore*.
2. **B. Javanus**, Lamarek, Anim. s. Vert. v. 439, 1818.
Blainville, Malacol. t. 81, f. 2. Crouch, Introd. Lam. t. 2,
f. 5, 6. Cuvier, Audouin's Edit. t. 119, f. 2. Wyatt,
Conch. t. 33, f. 3. Reeve, Conch. Syst. t. 17, f. 3—5.
Reeve, Monog. *Aspergillum*, t. 1, f. 3. Deshayes, Traite
Elem. f. 1—3. Chenu, Ill. Conch. t. 2, f. 1, 2. Bosc,
Hist. del Moll. v. t. 41, f. 1. Adams' Genera, t. 91, f.
4a.
Aspergillum Listeri, Gray, Annals of Philosophy, 1825.
Java.
3. **B. pulchrus**, Deshayes, Reeve Monog. t. 3, f. 13, 1860.
Singapore.

Sub-genus WARNEA, Gray.

London Zool. Proc. 309, 1858.

4. **B. Australis**, Chenu, Illust. Conch. 3, t. 3, f. 1.
Aspergillum Cumingianum, Chenu, Illust. Conch. 3, t. 3, f. 4.
Reeve, Monog. *Aspergillum*, t. 2, f. 7, 1860.
Aspergillum incertum, Chenu, Illust. Conch. 4, t. 4, f. 5.
Reeve, Monog. *Aspergillum*, t. 4, f. 19, 1860. *Australia*.

5. **B. vaginiferus**, Lamarek, Anim. s. Vert. v. 430, 1818.
 Sowerby, Genera, f. 1, 2. Hanley, Desc. Cat. t. 9, f. 23.
 Ruppell; Reise, N. Africa, t. 12, f. 2. Savigny, Expl.
 Egypt, t. 14, f. 9. Gnerin, Iconog. du Reg. Anim. t. 33,
 f. 7. Reeve, Conch. Syst. t. 17, f. 1, 2. Chenu, Illust.
 t. 1, f. 1, t. 4, f. 9, t. 5, f. 1—8. Gray, Figures Moll.
 Anim. t. 341., f. 2. Reeve, Monog. Asperg. t. 1, f. 2.
 Adams' Genera, iii. t. 91, f. 4.
Aspergillum Delessertianum, Chenu, Conch. Illust. 3, t. 1, f. 2.
 Reeve, Monog. Asperg. t. 2, f. 6. *Red Sea.*

GENUS **PENICILLUS**, Gray.

London Zool. Proc. 312, 1858.

1. **P. aquaria**, Burrow, Elem. 166, t. 22, f. 3.
Aspergillum sparsum, Sowerby, Genera, No. 27, f. 3—5.
Aspergillum semifimbriatum, Chenu, Illust. Conch. 4, t. 3, f. 5.
 Reeve, Monog. Asperg. t. 2, f. 5. *Red Sea.*
2. **P. dichotoma**, Chenu, Illust. Conch. 3, t. 2, f. 6.
 Reeve, Monog. Asperg. t. 3, f. 9.
Aspergillum disjunctum, Reeve, Monog. Asperg. t. 3, f. 12,
 1860. *Singapore.*
3. **P. radix**, Deshayes, Reeve, Monog. Asperg. t. 3, f. 11,
 1860. *Amboina.*

Sub-genus **CLEPSYDRA**, Gray.

London Zool. Proc. 312, 1858.

4. **C. strangulata**, Chenu, Illust. Conch. 3, t. 2, f. 4.
N. E. Australia.

GENUS **FÆGIA**, Gray.

Synopsis Brit. Mus. 1840.

1. **F. agglutinans**, Lamarek, Anim. s. Vert. v. 430, 1818.
 Cuvier, Audouin's Edit. t. 119, f. 1. Hanley, Desc. Cat.
 t. 10, f. 19. Chenu, Illust. Conch. Asperg. t. 3, f. 2.
 Reeve, Monog. Asperg. t. 4, f. 18.
Aspergillum Novæ Zelandiæ, Lamarek, Anim. s. Vert. v. 430,
 1818. Hanley, Desc. Cat. t. 9, f. 54. Chenu, Illust.
 Conch. t. 2, f. 6—9. Reeve, Monog. Asperg. t. 4, f. 17.
Aspergillum Novæ Hollandiæ, Chenu, Illust. Conch. 4, t. 4,
 f. 8. *Australia.*
2. **F. Zebuense**, Chenu, Illust. Conch. 3, t. 3, f. 3.
 Reeve, Monog. Asperg. t. 3, f. 8.
Aspergillum Philippinense, Chenu, Illust. Conch. 3, t. 4, f. 7.
 Reeve, Monog. Asperg. t. 3, f. 10. *Philippines.*

Sub-genus **ARYTENE**, Gray.

London Zool. Proc. 313, 1858.

3. **F. Recluziana**, Chenu, Illust. Conch. Asp. 4, t. 4, f. 1.
Aspergillum incrassatum, Chenu, Ill. Conch. Asp. 4, t. 4, f. 2.
 Reeve, Monog. Asperg. t. 4, f. 15. *Hab.*—?
4. **F. tuberculata**, Chenu, Illust. Conch. Asp. 3, t. 2, f. 3.
 Reeve, Monog. Asperg. t. 3, f. 16.
Aspergillum ornatum, Chenu, Illust. Conch. Asp. t. 4, f. 3.
Aspergillum clavatum, Chenu, Illust. Conch. Asp. 4, t. 4, f. 4.
 Reeve, Monog. Asperg. t. 4, f. 14. *Moluccas.*

GENUS **HUMPHREYA**, Gray.

London Zool. Proc. 316, 1858.

1. **H. Strangei**, A. Adams, London Zool. Proc. 91, 1852.
 Reeve, Monog. Asperg. t. 2, f. 4. *Sydney Bay, Australia.*

Family **TEREDIDÆ**, Carpenter.

Lectures on Mollusca, 100, 1861.

Sub-family **TEREDINÆ**, Tryon.

Proc. Philad. Acad. 193, 1862.

GENUS **TEREDO**, Linnæus.

Syst. Nat. 10th Edit. 651, 1758.

1. **T. bipartita**, Jeffreys, Ann. and Mag. Nat. Hist. 3d ser. vii. 123. *England.*
2. **T. dilatata**, Stimpson, Proc. Boston N. H. Soc. iv. 113, 1851. *Mass. to S. Car.*
3. **T. divaricata**, Deshayes MS. Fischer, Jour. de Conchyl. 2d ser. i. 137, t. 7, f. 7—9. *Sicily.*
4. **T. elongata**, Quatrefages, Ann. des Sc. Nat. 3d ser. xi. 33.
T. Senegalensis, Fischer, Mel. Conchyl. 19, t. 4, f. 2—6.
T. Petiti, Recluz, Rev. et Zool. 2d ser. i. 64. *E. Coast Africa.*
5. **T. excavata**, Lukis MS. Jeffreys, Ann. and Mag. N. Hist. 3d ser. vi. 123. *Guernsey and Sussex.*
6. **T. fusticulus**, Jeffreys, Ann. and Mag. N. Hist. 3d ser. vi. 124. *Leith.*

7. **T. malleolus**, Turton, Conch. Dithyra, 225, t. 2, f. 19, 1822.
Brown, Conch. Gt. Brit. 116, t. 50, f. 16. Hanley, Desc. Cat. t. 11, f. 23. Forbes and Hanley, Brit. Moll. i. 84, t. 1, f. 12—14. Sowerby, Illust. Brit. Shells, t. 1, f. 5.
England, Ireland, Sumatra.
8. **T. megotara**, Hanley, Brit. Conch. i. 77, t. 1, f. 6, t. 18, f. 1, 2, 1853.
Sowerby, Illust. Brit. Shells, t. 1, f. 3. *England.*
9. **T. nana**, Turton, Conch. Dithyra, 16, t. 2, f. 6, 7, 1822.
Brown, Conch. Gt. Brit. 116, t. 50, f. 14, 15. Hanley, Desc. Cat. t. 11, f. 22.
T. navalis (not of Linn.), Möller, Moll. Grien, 1842.
T. denticulata, Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. 386, 1851. *England, Northern Ocean, Greenland.*
10. **T. marina**, Sellius, Hist. Nat. Teredinis, t. 2, f. 2, 3, 6, 1733.
T. navalis, Linn., Syst. Nat. Edit. 10, 651, 1758. Bosc. Conch. t. 5, f. 4—7. Chenu, Encyc. Nat. Hist. Moll. f. 245—7. Cuvier, Edit. Griffith, xii. t. 8, f. 2. Cuvier, Edit. Audouin, Moll. t. 114, f. 2. Della Chiaje, Mem. iv. t. 54, f. 2, 8. Deshayes, Traite Elem., t. 3, f. 1—9. Forbes and Hanley, Brit. Moll. t. 1, f. 7, 8, t. 18, f. 3, 4. Guérin, Iconog. Regne Anim. Moll. t. 33, f. 2. Poli, Test. Utr. Sicil. t. 57, f. 45, 46. Sowerby, Illust. Brit. Shells, t. 1, f. 1.
Teredo Batava, Spengler, Skrivt. Nat. ii. pt. 1, 103, t. 2, f. C, 1792.
Teredo vulgaris, Lamarck, Syst. des Anim. s. Vert. 128, 1801.
England, Holland, Senegal, Mediterranean Sea, United States.
11. **T. navium**, Sellius, Hist. Nat. Ter. t. 1, f. 1, 5, 1733.
Teredo Norvegica, Spengler, Skrivt. Nat. ii. pt. 1, 102, t. 2, f. 4—6, 1792. Forbes and Hanley, Brit. Moll. t. 1, f. 1—5. Adams' Genera, t. 90, f. 6. Chenu, Man. de Conchyl. ii. f. 60, 61. Sowerby, Illust. Brit. Shells, t. 1, f. 2. Woodward, Manual, t. 23, f. 26, 27.
Teredo Bruguerii, Della Chiaje, Memorie, iv. 28, 32, t. 54, f. 9—12, 1836.
Teredo Deshayesii, Quatrefuges, Ann. des Sc. Nat. 3d ser. xi. 26.
Teredo fatalis, Quatrefuges, Ann. des Sc. Nat. 3d ser. xi. 23, t. 1, f. 1.
Teredo nigra, Blainville, Dict. Sci. Nat. lii. 267, 1828.

Teredo Senegalensis, Laurent, Jour. de Conchyl. i.

Teredo navalis (not of Linnæus), Brown, Conch. Gt. Brit. 116, t. 50, f. 1—7, 1844. Burrows, Elements, t. 22, f. 4. Crouch, Introd. to Lamarek, t. 2, f. 10. DeKay, Moll. N. York, t. 34, f. 325. Donovan, Brit. Shells, v. t. 145. Encyc. Meth. t. 167, f. 1—5. Mawe, Conch. t. 35. Paltney, Dorset. Cat. 53, t. 18, f. 21. Reeve, Conch. Syst. t. 21. Sowerby, Conch. Man. f. 48. Turton, Conch. dithyra, t. 2, f. 1—3. Wood, Index Test. t. 38, f. 2.

Septaria Mediterranea, Matheron, Ann. des Sci. du Midi. France, i. 77, ii. 312, t. 1. Deshayes, Traite Elem. t. 2, f. 9, 10. Cuvier, Edit. Audouin, t. 114, f. 3, 1836.

Fistulana coniformis, Lamarek, Anim. s. Vert. v. 435, 1818. Blainville, Man. Malacol. t. 81, f. 4. Chenu, Man. de Conchyl. ii. f. 63.

Teredo utriculus, Gmel., Syst. Nat. 3748, 1790. Kammerer, Cab. Rudolstadt, t. 1. Wood, Index Test., t. 38, f. 3.

British Channel, Senegal, Mediterranean, United States.

12. **T. pedicellata**, Quatrefages, Ann. des Sc. Phys. 3d ser. xi. 26, t. 1, f. 2. *British Channel, Spain, Algiers.*

13. **T. Senegalensis**, Blainville, Dict. Sci. Nat. lii. 267, 1828. Adanson, Hist. Nat. du Senegal, 254, t. 19. Adanson, Mem. de l'Acad. des Sc. t. 9, f. 9, 10. *Senegal.*

14. **T. spatha**, Jeffreys, Ann. and Mag. Nat. Hist. 3d ser. vi. 124. *Guernsey.*

15. **T. subericola**, Macgillivray MS., Jeffreys, Ann. and Mag. N. Hist. 3d ser. vi. 122. *Great Britain.*

16. **T. Thompsonii**, Tryon, Philad. Proc. Nov. 1863, t. 2, f. 3—5. *New Bedford, Mass.*

17. **T. truncata**, Quatrefages, Ann. des Sc. Nat. 3d ser. xi. 27.

Fischer, Jour. de Conchyl. 2d ser. i, 133. *Amboina.*

Sub-genus CALOBATES, Gould.

Proc. Boston Soc. Nat. Hist. viii. 280, 1862.

18. **T. Australis**, Wright, London Linnaean Trans. xxv. *W. Australia.*

19. **T. Manni**, (Kuphus) Wright, London Linnaean Trans. xxv. *Singapore.*

20. **T. thoracites**, Gould, Boston Proc. vi. 15. *Teredo Furcelloides*, Gray. *Burmah.*

GENUS **NAUSITORIA**, Wright.

Linnean Trans. London, xxiv, pt. 3, 1864.

1. **N. Dunlopei**, Wright, Linn. Trans. xxiv. pt. 3, 1864.
Comer River, India.
2. **N. Sauliæ**, Wright, Linn. Trans. xxv. *Australia.*

GENUS **UPEROTIS**, Guettard.

Memoirs, ii. 128.

Fistulana, Blainville, Dict. Sci. Nat. xvii. 82, 1820.

1. **U. clava**, Gmelin, Syst. Nat. 3748, 1790.
Guettard, Mem. iii. t. 7, f. 6—9. Wood, Index Test. t. 38, f. 4.
Fistulana gregata, Lamarck, Anim. s. Vert. v. 435, 1818.
Encyc. Meth. t. 167, f. 6—14. Griffith's Cuvier, xii. t. 8, f. 3. Guerin, Iconog. Moll. t. 33, f. 3. Schröter, Einleit. ii. t. 6, f. 20.
Teredo nucivorus, Spengler, Skrivt. Nat. ii. pt. 1, 105, t. 2, f. D, 1792. Cuvier, Audouin's Edit. t. 114, f. 4. Deshayes, Traite Elem. t. 2, f. 15—18.
Tranquebar, Pondichery, &c.

GENUS **XYLOTRYA**, Leach.

Adams' Genera, ii. 333, 1856.

1. **X. bipennata**, Turton, Conch. Dict. 184, f. 38—40, 1819.
Hanley, Desc. Cat, t. 9, f. 50. Forbes and Hanley, Brit. Moll. t. 1, f. 9—11.
X. pennatifera (part.), Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. 386.
Teredo carinata, Leach, Blainville, Dict. Sc. Nat. lii. 269, 1820.
Teredo navalis, Home, Philos. Trans. 276, 1806.
England, Sumatra.
2. **X. cucullata**, Norman, Jeffreys, Ann. and Mag. N. Hist. 3d ser. vi. 125.
Guernsey, Belfast.
3. **X. fimbriata**, Jeffreys, Ann. and Mag. N. Hist. 3d ser. vi. 126.
X. palmulata (not of Lamarck nor Philippi), Forbes and Hanley, Brit. Moll. i. 86, t. 2, f. 9—11, 1853. Sowerby, Illust. Brit. Shells, t. 1, f. 6.
Teredo bipalmulata (not of Lamarck), Thompson, Ann. and Mag. N. Hist. 1847. *England. New Bedford, Mass.*

4. **X. minima**, Blainville, Dict. des Sc. Nat. lii. 268, 1820.
Teredo bipalmulata, Chiaje, Mem. iv. 28, t. 54, f. 18, 22—24.
Teredo palmulata, Philippi, Enum. Moll. Sicil. i. 3, ii. 2, t. 1,
 f. 8, 1836—44.
Teredo Philippii, Gray, Ann. and Mag. N. Hist. 2d ser. viii.
 386. *Mediterranean*.
5. **X. palmulata**, Lamarek, Anim. s. Vert. v. 440, 1818.
 Blainville, Malacol. t. 80 bis, f. 8. Chenu, Man. Conchyl.
 ii. f. 64, 65. Griffith's Cuvier, xii. t. 7, f. 5. Hanley,
 Desc. Cat. t. 11, f. 13. Adams' Genera, t. 90, f. 6 E.
Teredo bipalmulata, Lamarek, Syst. Anim. s. Vert. 126, 1801.
East Indies.
6. **X. pennatifera**, Blainville, Dict. Sc. Nat. lii. 269, 1820.
X. palmulata, Leach, Gray, Ann. and Mag. Nat. Hist. 2d
 ser. vii. 386. *British Channel*.
7. **X. setacea**, Tryon, Philad. Proc. 1863, t. 1, f. 2—3.
San Francisco, Cal.

KUPHINÆ, Tryon.

Proc. Philad. Acad. 1862, Monog. 124.

GENUS **KUPHUS**, Guettard.

Mem. iii. 139.

Furcella, Lamarek, Syst. Anim. s. Vert. 104, 1801.

Septaria, Lamarek, Anim. s. Vert. v. 436. 1818.

Clausaria, Menke, Syn. Meth. Edit. i. 1828.

1. **K. arenarius**, Linnæus, Syst. Nat. ed. 10, 787, 1758.

Rumphius, Mus. t. 41, f. D, E.

Serpula gigantea, Schröter, Einleit. ii. 557, 1784.

Furcella gigantea, Gray, Zool. Proc. pt. 25, 243, t. 39, f. 1—3.

Teredo gigantea, Home, Philos. Trans. 276, t. 10, 11, f. 1—7,
 1806. Wood, Index, Text. t. 38, f. 1.

Serpula polythalamia, Linnæus, Syst. Nat. Edit. 12, 1766.

Serpula anguina, B., Gmelin, Syst. Nat. 3, 743, 1790.

Philippines, Van Dieman's Land.

CATALOGUE

OF THE

FAMILY SOLENIDÆ.

By T. A. CONRAD.

Family SOLENIDÆ.

GENUS **NOVACULINA**, Benson.

Gleanings in Science, 63, 1830.

1. **N. constricta** (*Solen*), Lam., An. sans Vert. v. 455, 1838.
China, Japan.
2. **N. Gangetica**, Benson, Glean. in Science, ii. 63, 65, 1830.
Ganges.
3. **N. ? olivacea**, Metcalfe, H. and A. Adams, Gen. of Shells,
ii. 348, 1858. *India.*

GENUS **SILICULARIA**, Schum.

Essai, 129, 1817.

1. **S. affinis** (*Solecurtus*), Adams, Panama Shells, 300, 1852.
Panama.
2. **S. californiana** (*Cultellus*), Conrad, Jour. Acad. Nat. Sci.
vii. 233, pl. 18, f. 3, 1834. *California.*
3. **S. Carpenteri**, Dunker, Zool. Proc. 426, 1861.
South Carolina, Curaccas.
4. **S. Dombeyi** (*Solen*), Lam., An. sans Vert. v. 454, 1838.
Ency. Method. pl. 224, f. 1.
Glycimeris rufa, Bosc., Hist. Nat. de Coq. iii. 6, pl. 17, f. 3,
1824. *South America.*

5. **S. gibba** (*Solen*), Spengler, Skrivt. Nat. Sels. iii. 104, 1793.
North America, Carribean Sea.
6. **S. nitidissima**, Dunker, Zool. Proc. 426, 1861. *Peru.*
7. **S. Peruana**, Dunker, Zool. Proc. 426, 1861. *Peru.*
8. **S. Platensis** (*Soleeurtus*), D'Orbigny. Voy. dans l'Amer.
523, pl. 81. f. 23. 1835. *E. coast meridional America.*
9. **S. polita**, Carpenter.
10. **S. pulchra**, Gould.
11. **S. tagal** (*Solen*), Adanson, Nat. Hist. Senegal, 255, pl. 19,
fig. 1, 1759.
S. Guineensis, Chem., Conch. Cab. xi. 202, f. 1937, 1795.
S. Adansonii, Bosc. Hist. Nat. de Coq. 1824. *Senegal.*

GENUS **AZOR**, Gray.

1. **A. coarctatus** (*Solen*), Gmelin, 3224.
Forbes and Hanley, Brit. Moll. i. 259, pl. 15, f. 3, 1853.
Azor antiquatus, Brown, Illust. Conch. G. Brit. 113, pl. 47,
f. 6, 7, 1844. *Europe.*
2. **A. minutus**, Dunker, Zool. Proc. 425, 1861. *Philippines.*
3. **A. oblongus**, Dunker, Zool. Proc. 425, 1861. *Philippines.*
4. **A. Scheepmakeri**, Dunker (*Maacha scheepmakeri*? Dunker).
5. **A. solidus**, Dunker, Zool. Proc. 425, 1861. *Philippines.*

GENUS **MESOPLEURA**, Conrad, MSS.

1. **M. bidentata** (*Solen*), Spengler, Skrivt. Nat. Sels. iii. 104.
S. bidens, Chem., xi. pl. 203, f. 1939, 1795.
S. fragilis, Pultney, Cat. of Dorsetshire, 1799.
S. centralis, Say, Jour. A. N. S. ii. 316, 1822.
S. Floridanus, Conrad. *Nicobar Isles? West Indies.*
2. **M. Javanica** (*Solen*), Lam., An. sans Vert. v. 454, 1818.
Java.
3. **M.? subteres** (*Cultellus*), Conrad, Jour. Acad. Nat. Sci.
vii. 233, pl. 17, f. 10, 1834. *California.*

GENUS **MACHA**, Oken.

1. **M. abbreviata** (*Soleeurtus*), Gould, Proc. Bost. Soc. Nat.
Hist. viii. 26, 1862. *Hong Kong.*
2. **M. alba** (*Solen*), Martyn, Univ. Conch. pl. 157, 1782.
3. **M. australis**, Dunker.

4. **M. candida**, Rinieri, Coq. de Adriatic.
Deshayes, Traite Elém. pl. 6, f. 12, 13, 1835.
Solen strigillatus, var., Chemnitz. Var. B., Philippi.
5. **M. Cumingiana**, Dunker, Zool. Proc. 425, 1861. *Antilles.*
6. **M. debilis**, Gould, Proc. Bost. Soc. Nat. Hist. viii. 26,
1862. *Loo Choo.*
7. **M. exarata**, Philippi.
H. and A. Adams, Gen. of Shells, ii. 346, 1858.
8. **M. Quoyi** (*Solen*), Deshayes.
Lam., An. sans Vert. vi. 63, 1818.
S. candidus, Quoy, Voy. Astrolabe, pl. 83, f. 11, 12, 1830.
Tongataboo.
9. **M. Sanctæ-Marthæ** (*Solen*), Chem., Conch. Cab. xi. 203,
f. 1938, 1795. *Cuba.*
10. **M. Scheepmakeri**, Dunker, Zeit. Malak. 56, 1852.
11. **M. strigilata** (*Solen*), Linn., Syst. Ed. xii. 1115, 1767.
Lister, Conch. t. 416, f. 260, 1685. Encyc. Method. pl.
224, f. 3. *Mediterranean and Atlantic.*
12. **M. strigosa** (*Solecurtus*), Gould, Proc. Bost. Soc. Nat.
Hist. viii. 26, 1862. *Whampoa.*

GENUS **SILIQUA**, Mühlfeldt.

Entw. 44, 1811.

Aulus, Oken, 1815.

1. **S. alba** (*Solen*), Martyn, Univer. Conch. pl. 157, 1782.
Valenciennes, Cat. Mus. Voy. Astrolabe, pl. 26, f. 6, 1830.
Borneo.
2. **S. borealis**, Conrad.
Machæra costata, Middendorff, Malac. Ross. pt. 3, p. 78, pl.
21, f. 4, 1847. *Sitka.*
3. **S. californica**, Conrad, Amer. Jour. Conch. iii. 193, 1867.
Body Bay, California.
4. **S. costata** (*Solecurtus*), Say, Jour. Acad. Nat. Sci. ii. 315,
1821.
Amer. Conch. pl. 8.
Machæra costata, Gould.
Great Egg Harbor, N. J., Atlantic United States.
5. **S. exarata**, Philippi.
6. **S. Grayanus** (*Aulus*), Dunker, Zool. Proc. 427, 1861.
7. **S. inflexa** (*Solen*), Wood, Gen. Conch. pl. 32, f. 1, 2, 1815.

8. **S. Japonicus** (*Aulus*), Dunker, Zool. Proc. 427, 1861.
Japan.
9. **S. lucida** (*Solecirtus*), Conrad, Jour. Acad. Nat. Sci. vii.
231, pl. 17, f. 8, 1834. *California.*
10. **S. media**, Gray, Zool. Buchey's Voy. 153, pl. 44, f. 2,
1839.
11. **S. minutissima** (*Solen*), Chem., Conch. Cab. 1795.
S. minima, Gmel.
12. **S. patula** (*Solen*), Dixon, Voyage around the World, 334,
f. 2, 1789.
S. maximus, Wood, Gen. Conch. pl. 31, f. 2, 1815.
Solecirtus Nuttallii, Conrad. *Sandwich Islands.*
13. **S. polita** (*Solen*), Wood, Desc. Cat. Supp. pl. 1, f. 6, 1836.
Red Sea.
14. **S. pulchella** (*Aulus*), Dunker, Zeit. Malak. 58, 1863.
Japan.
15. **S. radiata** (*Solen*), Linn., Syst. Nat. Ed. xii. p. 1114.
Sumatra.
16. **S. rostratus** (*Aulus*), Dunker, Zool. Proc. 427, 1861.
Arctic Region.
17. **S. sodalis** (*Machæra*), Gould, Proc. Bost. Soc. Nat. Hist.
viii. 26, 1862. *Hakodadi Bay.*
18. **S. ? squama**, Blainville.
H. and A. Adams, ii. 345, 1858.
19. **S. ? violacea**, Deshayes.
H. and A. Adams, ii. 345, 1858.
20. **S. Winteriana**, Dunker, Zeit. Malak. 57, 1852. *Java.*

GENUS **CULTELLUS**, Schumacker.

Ess. 130, 1817.

1. **C. attenuatus**, Dunker, Nov. Conch. 72, pl. 24, f. 4, 1858.
Philippines.
2. **C. australis**, Dunker, Zool. Proc. 422, 1861. *Philippines.*
3. **C. concinnus**, Dunker, Zool. Proc. 423, 1861. *Philippines.*
4. **C. cultellus** (*Solen*), Linn., Syst. Nat. Ed. xii. 1114, 1758.
Enc. Method. pl. 223, f. 4. *Indian Ocean.*
5. **C. Cumingianus**, Dunker, Zool. Proc. 422, 1861.
Philippines.
6. **C. Hanleyi**, Dunker, Zool. Proc. 421, 1861.

7. **C. lividus**, Dunker, Zool. Proc. 423, 1861. *Philippines.*
8. **C. marmoratus**, Dunker, Zool. Proc. 423, 1861. *Philippines.*
9. **C. pellucidus** (*Solen*), Pennant, Brit. Zool. iv. pl. 46, f. 3, 1776. *Europe.*
10. **C. politus**, Dunker, Zool. Proc. 422, 1861. *River Gambia.*
11. **C. subellipticus**, Dunker, Zool. Proc. 421, 1861. *Malacca.*
12. **C. vitreus**, Dunker, Zool. Proc. 422, 1861. *Singapore.*

GENUS **PHARELLA**, Gray.

1. **P. acuminatus** (*Solen*), Hanley, Zool. Proc. 122, 1842.
Novaculina acuminata, H. and A. Adams, Gen. of Shells, ii. 347, 1858. *India.*
2. **P. acutidens**, Broderip and Sowerby, Zool. Jour. iv. 361, 1835.
Gray, Zool. Beechey's Voy. 153, pl. 43, f. 2, 1831. *Sumatra, Loo Choo, India.*
3. **P. orientalis** (*Cultellus*), Dunker, Zeits. f. Mal. 31, 1850.
Nov. Conch. 10, pl. 3, f. 3, 1858. *East Indies.*
4. **P. ovalis**, Dunker, Zool. Proc. 423, 1861. *Singapore.*

GENUS **PHARUS**, Leach.

Syn. Brit. Mus. 1840.

1. **P. legumen** (*Solen*), Linn., Syst. Nat. Ed. xii. 1114, 1767.
Chem., vi. t. 5, f. 32—4. Ency. Method. pl. 225, f. 3. *Mediterranean, Atlantic.*
2. **P. scalprum** (*Solen*), Gould, Proc. Bost. Soc. Nat. Hist. iii. 214, 1848.
Mollusc. Explor. Ex. pl. 33, f. 6. *Obtained at Singapore.*

GENUS **ENSIS**, Schumacker.

Ess. 143, 1817.

1. **E. Americanus**, Beck.
H. and A. Adams, Gen. of Shells, ii. 342, 1858.
2. **E. asperus**, Dunker, Zool. Proc. 420, 1861. *Australia.*
3. **E. ensis** (*Solen*), Linn., Syst. Nat. Ed. xii. 1114.
Ency. Method. pl. 23, f. 3. *Europe, and Atlantic North America.*

4. **E. Gaudichaudii** (*Solen*), Ency. Method. pl. 223, f. 1, 2, 1792.
Chenu, Illust. Conch. Monog. pl. 2, f. 7.
5. **E. Lischeanus** (*Solen*), Dunker, Nov. Conch. 70, pl. 24, f. 1, 1858. *Red Sea.*
6. **E. Luzonicus**, Dunker, Zool. Proc. 421, 1861. *Philippines.*
7. **E. macha**, Molina.
H. and A. Adams, Gen. of Shells, ii. 342, 1858.
8. **E. minor** (*Solen*), Linn., Syst. Nat. Ed. xii. 1114.
9. **E. Pfeifferi**, Dunker, Zool. Proc. 420, 1861. *Caraceas.*
10. **E. pictus** (*Solen*), Chenu, Conch. Illus. Monog. pl. 1, f. 6.
11. **E. scalprum** (*Solen*), King, Zool. Jour., v. 355, 1835.
D'Ofbigny, Voy. dans l'Amer. Moll. pl. 77, f. 22. *Patagonia.*
12. **E. siliqua** (*Solen*), Linn., Syst. Nat. Ed. xii. 1113, 1767.
Enc. Method. pl. 222, f. 2. *Europe.*
13. **E. vaginoides** (*Solen*), Lam., An. sans Vert. v. 451, 1838. *Australia.*
14. **E. Woodwardii** (*Solen*), Dunker, Proc. Zool. Soc. 420, 1861.
Nov. Conch. 70, pl. 24, f. 2. *Philippines.*

GENUS **SOLENA**, Browne.

Nat. Hist. Jamaica, 412, 1756.

1. **S. obliqua** (*Solen*), Spengler, Scrivt. Nat. Sels. iii. 104, 1793.
Solen ambiguus, Lam. *Cuba.*
2. **S. Phillippinara** (*Solen*), Hanley, Zool. Jour. 101, 1843.
Desc. Cat. 337, pl. 12, f. 42. *Philippines.*
3. **S. rudis** (*Solen*), C. B. Adams, Shells of Panama, 300, 1852. *Panama.*

GENUS **SOLEN**, Linn.

Syst. Nat. Ed. x. 672, 1758.

1. **S. abbreviatus**, Philippi, Abbild. i. 35, pl. 1, f. 1, 1845. *East Indies.*
2. **S. acinaces**, Hanley, Zool. Proc. 101, 1843.
3. **S. Becki**, Philippi, Abbild. 5, pl. 2, f. 1, 1845.

4. *S. brevis*, Gray, Hanley's Sp. Shells, 12, pl. 13, f. 42,
1842. *American Seas.*
5. *S. Chemnitzii*, Chenu, Conch. Illust. Monog. pl. 1, f. 5.
6. *S. corneus*, Lam., An. sans Vert. v. 451, 1838. *Java.*
7. *S. cylindraceus*, Hanley, Zool. Proc. 101, 1843.
Desc. Cat. 337, pl. 12, f. 41, 1856.
8. *S. Deshayesii*, Chenu, Conch. Illust. Monog. pl. 1, f. 10.
9. *S. exiguus*, Dunker, Zool. Proc. 419, 1861. *Borneo.*
10. *S. Jonesii*, Dunker, Zool. Proc. 419, 1861. *Australia.*
11. *S. gladiolus*, Gray, Zool. Beech, Voy. 153, pl. 43, f. 4,
1831. *South America.*
12. *S. Gouldii*, Conrad = *gracilis*, Gould, Bost. Soc. Nat.
Hist. viii. 26, 1862. *Hakodadi Bay.*
13. *S. gracilis*, Dunker, Zeits. für Mal. 12, 1847.
Dunker. Nov. Conch. 71, pl. 24, f. 3. *Philippine Isles.*
14. *S. grandis*, Dunker, Nov. Conch. 71, pl. 24, f. 5, 1858.
Philippine Isles.
15. *S. Guineensis*, Gray, Hanley's Desc. Cat. 12, pl. 13, f. 28.
16. *S. intermedius*, Koch., Philippi, Abbild. i. 37, pl. 1, f. 5,
1845. *East Indies.*
17. *S. Lamarckii*, Chenu, Conch. Illust. Mon. pl. 1, f. 2.
18. *S. Leanus*, Dunker, Zool. Proc. 419, 1861.
Philippine Islands.
19. *S. linearis*, Chemnitz, Conch. xi. pl. 198, f. 1931-2, 1795.
Nicobar Isles.
20. *S. Malaccensis*, Dunker, Nov. Conch. 72, pl. 24, f. 6,
1858. *Malacca.*
21. *S. marginatus*, Koch. Philippi, Abbild. 37, pl. 1, f. 6,
1845. *Africa.*
22. *S. niveus*, Hanley, Desc. Cat. 336, pl. 12, f. 40.
23. *S. regularis*, Dunker, Zool. Proc. 419, 1861. *Malacca.*
24. *S. rostriformis*, Dunker, Zool. Proc. 421, 1861.
25. *S. rostrum anatis*, Dunker. Zool. Proc. 420, 1861.
26. *S. Schultzeanus*, Dunker, Nov. Conch. 70, pl. 24, f. 1,
1858. *Near Lisbon.*

27. *S. sicarius*, Gould, Moll. Exp. Exp. 387, f. 501, 1852.
Townsend's Harbor and Straits of De Fuca.
28. *S. Sloanii*, Gray, Hanley's Desc. Cat. 12, pl. 11, f. 18.
29. *S. strictus*, Gould, Proc. Bost. Soc. Nat. Hist. viii. 26,
1848. *Hakodadi Bay.*
30. *S. Tehuelca*, D'Orbigny, Hanley's Desc. Cat. 13, pl. 10,
f. 30. (*Patagonia ? D'Orb.*) *Patagonia.*
31. *S. Timorensis*, Dunker, Zeit. Malak. 56, 1862. *Timor.*
32. *S. truncatus*, Sowerby, Gen. of Shells, 1847.
Reeve, Conch. Syst. pl. 24, f. 1. *Senegal, Ceylon.*
33. *S. vagina*, Linn. Syst.
34. *S. versicolor*, Philippi, Abbild. iii. pl. 2, f. 3, 1845.
35. *S. viridis*, Say, Jour. Acad. Nat. Sci. ii 316, 1821.
Atlantic United States.
36. *S. vitreus*, Dunker, Zool. Proc. 420, 1861. *Malacca.*
37. *S. Zeylanensis*, Leach.
H. and A. Adams, Gen. ii. 341, 1858.

CATALOGUE
OF THE
FAMILY MACTRIDÆ.

By T. A. CONRAD.

Family MACTRIDÆ.

GENUS **RANGIA**, Desmoulins.

Bull. Soc. Linn. Bord., t. v. p. 48, Febr. 1832.

1. **R. Cyrenoides**, Desmoulins, Act. Lin. Soc. Bord., iv. 58, 1830.
Gnathodon cuneata, Gray, Mag. Nat. Hist., 376, f. 34, 1837.
Florida, Alabama.
2. **R. flexuosa**, Conrad, Amer. Journ. Sci., O. S. xxxviii. 92, 1839. Florida.
3. **R. parva**, Petit, Journ. de Conch., iv. 358, 1853.
Gnathodon parvum, Petit, Jour. Conch., iv. 358, 1853.
Moreton Bay, Australia.
4. **R. rostrata**, Petit, Journ. de Conch., iv. 84, pl. 6, f. 1, 2, 3, 1853. Florida.

Sub-genus RANGIANELLA, Conrad.*

5. **R. trigona**, Petit, Journ. de Conch., iv. 84, pl. 6, f. 13, 14, 15, 1853.
Gnathodon trigonum, Petit, Journ. Conch., iv. 84, 1853.
Mazatlan.

* Lateral teeth straight, subequal, not elongated, entire.

GENUS **MULINEA**, Gray.

Mag. Nat. Hist., 376, 1837.

1. **M. angulata**, Gray, Brit. Mus., 1853.
Reeve's Conch. Icon. Monog. Mactra, f. 34, 1854.
Gulf of California.
2. **M. Byronensis**, Gray, Loudon's Mag. Nat. Hist., 376,
1837.
Reeve's Conch. Icon. Monog. Mactra, f. 77, 1854.
Pacific, S. A.
3. **M. carinulata**, Deshayes, Zool. Pro., 67, 1854.
Reeve's Conch. Icon. Monog. Mactra, f. 38, 1854.
4. **M. donaciformis**, Gray, Mag. Nat. Hist., 376, 1837.
Beech, Voy., pl. 44, f. 13, 1831.
Reeve's Conch. Icon. Monog. Mactra, f. 62, 1854.
Panama.
5. **M. edulis**, King, Zool. Journ., v. 335, 1835.
Port Famine, Straits of Magellan.
6. **M. exalbida**, Gray, Brit. Mus., 1853.
Reeve's Conch. Icon. Monog. Mactra, f. 78, 1854.
Pacific, S. Am.
7. **M. Isabelliana**, d'Orbigny, Voy. dans l'Am. Moll., 509,
pl. 77, f. 25, 26, 1835—43.
Mouth of the La Plata River.
8. **M. lateralis**, Say, Journ. Acad. Nat. Sc., ii. 309, 1821.
Mactra rostrata, Philippi, Abbild. iii. 138, pl. 3, f. 6, 1845.
Mactra corbuloides, Desh., Reeve's Conch., f. 103.
Atlantic U. States, Galveston.
9. **M. Patagonica**, d'Orbigny, Voy. dans l'Am. Moll., 509,
pl. 77, f. 27, 1835—43.
Between the mouth of Rio Negro and Bay of San Blas, Patagonia.
10. **M. pinguis**, Crosse and Fischer, Journ. de Conch., vi.
349.
Australia.
11. **M. Portoricensis**, Shuttleworth, Journ. de Conch., i. 174,
2d ser. 1856.
Porto Rico.
12. **M. Rodatzi**, Dunker.
13. **M. typica**, Gray, Mag. Nat. Hist., 375, 1837.
Reeve's Conch. Icon. Monog. Mactra, f. 45, 1854.
14. **M. ventricosa**, C. B. Adams, Shells of Panama, 293,
1852.
Lutraria ventricosa, Gould, Proc. Bost. Soc. Nat. Hist., iv.
89, 1851.
Panama.

GENUS **MACTRA**, Linn.

Syst. Nat., ed. xii. 1125, 1767.

1. **M. Gaudelupensis**, Recluz, Journ. de Conch., iii. 249, 1852.
M. grandis, Lam., An. sans Vert. (Desh. ed.), vi. 99, 1835.
M. Lamarckii, Philippi, Abbild. ii. 73, 1845. *Guadaloupe*.
2. **M. maxima**, Chemnitz, Conch. Cab., vi. 229, pl. 23, f. 288, 1782.
M. grandis, Gmel., p. 3259, Philippi, Abbild. ii. 73, 1845.
3. **M. nitida**, Schroëter, Einl. Conch., iii. pl. 8, f. 2, 1783.
 Reeve's Conch, f. 46.
M. straminea, Lam.
4. **M. Spengleri**, Linn., Syst. Nat. (12th ed.), 1125, 1767.
 Reeve Conch. Icon. Monog. Mactra, f. 40, 1854.
Cape of Good Hope.
5. **M. tumida**, Chemnitz, Conch. Cab., vi. 218, f. 210, 212, 1782.
 Reeve's Conch. Icon. Monog. Mactra, f. 21, 1858.
Island of St. Thomas.

GENUS **HEMIMACTRA**, Swainson.

1. **H. aspera**, Sowerby, Tankerville Cat. Appen. 2, 1825.
 Reeve, Conch. Icon. Monog. Mactra, f. 65, 1854.
Spizula tenera, Humph. ? Gray, Loudon's Mag. Nat. Hist. 1837. *Philippines*.
2. **H. Dysoni**, Deshayes.
3. **H. elliptica**, Brown, Ill. Conch. Brit. 109, pl. 41, f. 6, 1845.
 Reeve, Conch. Icon. Monog. Mactra, f. 101, 1854.
British and French Seas.
4. **H. elongata**, Quoy and Gaim., Voy. Astrolabe, pl. 111, f. 5, 8, 1834.
 Reeve, Conch. Icon. Monog. Mactra, f. 43, 1854.
Spizula elongata, Gray, Loudon's Mag. Nat. Hist. 1837.
New Zealand.
5. **H. Mariæ**, A. Adams.
6. **H. rostrata**, Spengler, Skrivt. Nat. Selskab. v. 115, 1799.
 Reeve, Conch. Icon. Monog. Mactra. f. 104, 1854.
Moreton Bay, Australia.

7. **H. rufescens**, Lam., An. sans Vert. (Desh. ed.) vi. 102, 1835.
Reeve, Conch. Icon. Monog. Mactra, f. 9, 1858.
Van Dieman's Land.
 8. **H. Sayi**, Gray, Mag. Nat. Hist. 373, 1837.
Reeve, Conch. Icon. Monog. Mactra, f. 33, 1858.
Spizula Sayi, Gray, Mag. Nat. Hist. 373, 1837. *Florida.*
 9. **H. solida**, Linn., Syst. Nat. (12th ed.) 1126, 1767.
Chemnitz, Conch. Cab. vi. f. 230, 1782.
Europe, European Seas.
 10. **H. solidissima**, Chemn., Conch. Cab. x. 170, f. 1656, 1788.
Reeve, Conch. Icon. Monog. Mactra, f. 8, 1854.
Atlantic Coast of United States.
 11. **H. sublanceolata**, Deshayes, Zool. Proc. 66, 1854.
Reeve, Conch. Icon. Monog. Mactra, f. 74, 1854.
 12. **H. subtruncata**, Da Costa, Brit. Conch. 198, 1778.
Reeve, Conch. Icon. Monog. Mactra, f. 90, 1854.
Trigonella subtruncata, Da Costa, Brit. Conch. 198, 1778.
Spizula subtruncata, Gray, Loudon's Mag. Nat. Hist. 373, 1837.
European Seas.
 13. **H. tellinoides**, Deshayes.
 14. **H. triangula**, Reneire.
Philippi, Ena. Sicil. 11, 1836—44. Reeve, Conch. Icon. Monog. Mactra, f. 94, 1854.
M. Eurinica, Krynicki, Bull. de Moscou, No. 2, 63, 1837.
Mediterranean.
 15. **H. truncata**, Montagu, Test. Brit. Supp. 34, 1808.
Reeve, Conch. Icon. Monog. Mactra, f. 42, 1854.
Trigonella Tonaria, Da Costa, 1788.
M. crassatella, Lam., An. s. Vert. vi. 107, 1835.
Spizula truncata, Gray, Loudon's Mag. Nat. Hist. 373, 1837.
Europe.
- Sub-genus OXYPERAS, Mörch.
16. **H. æquilateralis**, Deshayes, Zool. Proc. 17, 1854.
New Zealand.
 17. **H. transversa**, Deshayes, Zool. Proc. 66, 1854.
Reeve, Conch. Icon. Monog. Mactra, f. 88, 1854.
 18. **H. triangularis**, Lam., An. sans Vert. vi. 103, 1835.
Reeve, Conch. Icon. Mong. Mactra, f. 1, 1854.
Spizula triangularis, Gray, Loudon's Mag. Nat. Hist. 1837.

GENUS **HARVELLA**, Gray.

1. **H. elegans**, Sowerby, Tankerville Cat. No. 116, App. 2, pl. 1, f. 3, 1825.
 Reeve, Conch. Icon. Monog. Mactra, f. 89, 1854.
Harvella elegans, Gray. *Panama.*

GENUS **MACTRELLA**, Gray.

Mag. Nat. Hist. 372, 1837.

1. **M. alata**, Spengler, Skrivt. Nat. Selsk. v. pt. 2, 99, 1799.
 Reeve, Conch. Icon. Monog. Mactra, f. 29, 1854.
Mactra carinata, Lam., An. s. Vert. (Desh. ed.) 98, 1835.
West Colombia.
2. **M. exoleta**, Gray, Mag. Nat. Hist. 372, 1837.
 Reeve, Conch. Icon. Monog. Mactra, f. 16, 1854.
Mactra exoleta, Gray. *Panama.*

GENUS **MACTRINULA**, Gray.

1. **M. angulifera**, Deshayes, Zool. Proc. 70, 1854.
 Reeve, Conch. Icon. Monog. Mactra, f. 83, 1854.
Philippines.
2. **M. angusta**, Deshayes, Zool. Proc. 67, 1854.
 Reeve, Conch. Icon. Monog. Mactra, f. 93, 1854. *Panama.*
3. **M. complanata**, Deshayes, Zool. Proc. 14, 1853.
 Reeve, Conch. Icon. Monog. Mactra, f. 54, 1854.
Indian Ocean.
4. **M. dolabrata**, Deshayes, Zool. Proc. 66, 1854.
 Reeve, Conch. Icon. Monog. Mactra, f. 107, 1854.
5. **M. egena**, Deshayes, Zool. Proc. 68, 1854.
 Reeve, Conch. Icon. Monog. Mactra, f. 71, 1854.
6. **M. explanata**, Deshayes, Zool. Proc. 66, 1854.
 Reeve, Conch. Icon. Monog. Mactra, f. 70, 1854.
Swan River, Australia.
7. **M. falcata**, Gould, Proc. Bost. Soc. Nat. Hist. iii. 216, 1851.
Puget Sound.
8. **M. lævis**, Chemnitz, Conch. Cab. vi. pl. 21, f. 205, 206, 1782.
 Reeve, Conch. Icon. Monog. Mactra, f. 27, 1854.
Mactra subplicata, Lam., An. sans Vert. (Desh. ed.) vi. 103, 1835.

9. **M. nasuta**? Gould, Proc. Bost. Soc. Nat. Hist. iv. 88, 1854.
Mollusc. Explor. Exp. pl. 34, f. 506, 1852.
San Pedro, California.
10. **M. ovalina**, Lam., An. sans Vert. (Desh. ed.) vi. 104, 1835.
Reeve, Conch. Icon. Monog. Mactra, f. 66, 1835.
11. **M. plicataria**, Linn., Syst. Nat. (12th ed.) 1125.
Chemn., Conch. Cab. f. 202—4, 1782. Reeve, Conch. Icon. Monog. Mactra, f. 26, 1854. *Indian Ocean.*
12. **M. Reevesii**, Gray, An. and Mag. Nat. Hist. 372, 1837.
Reeve, Conch. Icon. Monog. Mactra, f. 92, 1854. *Malacca.*
13. **M. striatula**, Linn., Syst. Nat. (12th ed.) 1125, 1767.
Mediterranean Sea.
14. **M. vitrea**, Gray, An. and Mag. Nat. Hist. 372, 1837.
Reeve, Conch. Icon. Monog. Mactra, f. 44, 1854. *Moluccas.*

GENUS **TRIGONELLA**, Da Costa.

Test. Brit., 1778.

1. **T. abbreviata**, King, H. and Adams, Genera iii. 375, 1858.
2. **T. achatina**, Chemnitz, Conch. Cab., ii. 218, f. 1957, 1773.
Reeve Conch. Icon. Monog. Mactra, f. 51, 1854.
Mactra maculosa, Lam., An. sans Vert., vi. 100, 1835.
M. adspersa, Dunker.
M. maculata, Hanley, Desc. Cat., 30, 1842.
Philippine Isles.
3. **T. Adansonii**, Philippi, Zeits. für Malac., 152, 1848.
Reeve Conch. Icon. Monog. Mactra, f. 49, 1854. *Senegal.*
4. **T. alba**, Lam., An. sans Vert. (Desh. ed.), vi. 104, 347, 1835.
Indian Seas.
5. **T. alta**, Deshayes, Zool. Pro., 347, 1854.
6. **T. amygdala**, Crosse and Fischer, Journ. de Conch., 349, 1864.
Australia.
7. **T. antiquata**, Spengler, Skrivt. Nat. Selsk., v. 102, pt. 2, 1799.
Reeve Conch. Icon., f. 22. *Bay of Manilla.*
8. **T. Aphrodina**, Deshayes, Zool. Pro., 62, 1854.
Reeve Conch. Icon. Monog. Mactra, f. 105, 1854.
China Seas.

9. **T. apicina**, Deshayes, Reeve Conch. Icon. Monog. Mactra, f. 111, 1854.
10. **T. Artensis**, Montrouzier, Journ. de Conch., 2d ser. iv. 111, pl. 2, f. 1, 1860. *Caledonia Archipelago.*
11. **T. attenuata**, Deshayes, Zool. Pro., 62, 1854.
Reeve Conch. Icon. Monog. Mactra, f. 97, 1854.
12. **T. Bonneau**, Bernardi, Journ. de Conch., 2d ser. iii. 92, pl. 2, f. 2, 1858. *Gulf of Tartary.*
13. **T. contraria**, Deshayes, Zool. Pro., 62, 1854.
Reeve Conch. Icon. Monog. Mactra, f. 86, 1854.
14. **T. corallina**, Linn., Syst. Nat. (12th ed.), 1125.
Reeve, Conch. Icon. Monog. Mactra, f. 50, 1854.
Mactra lactea, Chemnitz, Conch. Cab., vi. 1782.
Venice, Sicily.
15. **T. corbiculoides**, Deshayes, Zool. Pro., 62, 1854.
Reeve, Conch. Icon. Monog. Mactra, f. 98, 1854. *Ceylon.*
16. **T. cordiformis**, Deshayes.
Reeve, Conch. Icon. Monog. Mactra, f. 6, 1854.
17. **T. cornea**, Deshayes, Zool. Pro., 16, 1853.
Reeve, Conch. Icon. Monog. Mactra, f. 75, 1854.
18. **T. Cumingii**, Deshayes.
Reeve, Conch. Icon. Monog. Mactra, f. 24, 1854. *Moluccas.*
19. **T. cuneata**, Chemnitz, Conch. Cab., vi. 221, pl. 22, f. 215, 1782.
Reeve, Conch. Icon. Monog. Mactra, f. 109, 1854.
Mactra pupurea, Spengler. *Nicobar.*
20. **T. cygnea**, Chemnitz, Conch. Cab., vi. f. 207, 1782.
21. **T. decora**, Deshayes, Zool. Pro., 63, 1854.
Reeve, Conch. Icon. Monog. Mactra, f. 80, 1854.
22. **T. discors**, Gray, Fauna of N. Zealand, 251, 1844. Mag. Nat. Hist., 371, 1837. Reeve, Conch., f. 17.
Mactra discors, Gray. *New Zealand.*
23. **T. dissimilis**, Deshayes, Zool. Pro., 63, 1854.
Reeve, Conch. Monog. Mactra, f. 59, 1854. *Australia.*
24. **T. epidermia**, Deshayes.
Reeve, Conch. Monog. Mactra, f. 11, 1854.
Faro, Portugal.
25. **T. eximia**, Deshayes, Zool. Pro., 16, 1854.
Reeve, Conch. Icon. Monog. Mactra, f. 31, 1854.
Moreton Bay, Australia.

26. **T. fasciata**, Lam., An. sans Vert. (Desh. ed.), vi. 101, 1835.
Reeve, Conch., f. 52.
27. **T. gibbosula**, Deshayes.
Reeve, Conch. Monog. Mactra, f. 79, 1854. *Indian Seas.*
28. **T. glabrata**, Linn., Syst. Nat. (12th ed.), 1125, 1767.
Mactra polita, Chemnitz, 1782.
M. Australis, Lam., An. s. Vert., vi. 101, 1835.
African Ocean.
29. **T. glauca**, Born., Mus. Cæs. Vind., 51, pl. 3, f. 11, 12, 1780.
M. Neapolitana, Poli, Test. Sic., 1826.
30. **T. goniata**, Gray, Brit. Mus., 1854.
Deshayes, Zool. Pro., 70, 1854.
31. **T. Guadelupensis**, Recluz, Journ. de Conch., 2d ser. iii. 249, pl. 10, f. 4, 1858. *Guadaloupe.*
32. **T. helvacea**, Lam., An. sans Vert. (Desh. ed.), vi. 99, 1835.
M. glauca, Gmel., not Born.
33. **T. hepatica**, Deshayes, Zool. Pro., 63, 1854.
Reeve's Conch. Icon. Monog. Mactra, 110, 1854.
Island of Negros, Philippines.
34. **T. hians**, Philippi, Abbild. Mactra, pl. 2, f. 1, 1845.
Reeve's Conch. Icon. Monog. Mactra, f. 28, 1854.
Island of Mindanao, Philippines.
35. **T. incarnata**, Deshayes.
Reeve's Conch. Icon. Monog. Mactra, 61, 1854.
Swan River.
36. **T. incongrua**, Deshayes, Zool. Pro., 64, 1854.
Reeve's Conch. Icon. Monog. Mactra, f. 100, 1854.
Island of Luzon, Philippines.
37. **T. inequalis**, Deshayes, Zool. Pro., 64, 1854.
Reeve's Conch. Icon. Monog. Mactra, f. 87, 1854.
China Sea.
38. **T. intuspecta**, Deshayes, Zool. Pro., 64, 1854.
Manilla, China.
39. **T. kanakina**, Souverbie, Journ. de Conch., 2d ser. iv. 204, 311, pl. 11, f. 1, 1860. *Caledonian Archipelago.*
40. **T. Largilliertii**, Philippi, Zeits. für Malak., 162, 1848.
Abbild. ii. 135, pl. 3, f. 1. Reeve, Conch. Icon. Monog. Mactra, f. 23, 1858. *Gaboon, West Africa.*

41. **T. lilacea**, Lam., An. sans Vert. (Desh. ed.), vi. 106, 1835.
Reeve, Conch. Icon. Monog. Mactra, f. 49, 1854. *Lisbon?*
42. **T. lizor**, Adanson, Hist. Nat. Senegal, pl. 17, f. 16, 1757.
Senegal.
43. **T. lurida**, Philippi, Abbild. Mactra, 136, pl. 3, f. 3, 1845.
Reeve's Conch. Icon. Monog. Mactra, f. 96, 1854.
Liewkiew, China Sea, Island of Negros, Philippines.
44. **T. Luzonica**, Deshayes, Zool. Pro., 64, 1854.
Reeve's Conch. Icon. Monog. Mactra, f. 81, 1854.
Island of Luzon, Philippines.
45. **T. maculata**, Chemnitz, Conch. Cab., vi. 217, f. 208, 209, 1782.
Reeve's Conch. Cab., f. 56, 1782.
Mactra squalida, Lam., An. sans Vert. (Desh. ed.), vi. 105, 1835.
M. setosa, Quoy. *Philippines.*
46. **T. mera**, Deshayes, Zool. Pro., 16, 1853.
Reeve's Conch. Icon. Monog. Mactra, f. 82, 1854.
China Sea.
47. **T. Meretriciformis**, Deshayes, Zool. Pro., 16, 1853.
Reeve's Conch. Icon. Monog. Mactra, f. 18, 1854.
Port Essington.
48. **T. mitis**, Deshayes, Reeve's Conch. Icon. Monog. Mactra, f. 41, 1854. *Mouth of Gambia, W. Africa.*
49. **T. Murchinsoni**, Deshayes, Zool. Pro., 64, 1854.
Reeve's Conch. Icon. Monog. Mactra, f. 76, 1854.
N. Zealand.
50. **T. nitida**, Schroëter, Einl. Conch. iii. pl. 8, f. 2, 1783.
Reeve's Conch. Icon. Monog. Mactra, f. 46, 1854.
M. straminea, Lam., An. s. Vert., vi. 100, 1835.
51. **T. obesa**, Deshayes, Zool. Pro., 16, 1853.
Reeve's Conch. Icon. Monog. Mactra, f. 19, 1854.
Torres Straits, N. Australia.
52. **T. olorina**, Philippi, Abbild. ii. 72, pl. 2, f. 2.
Reeve's Conch. Icon. Monog. Mactra, f. 35, 1854.
Red Sea.
53. **T. opposita**, Deshayes, Zool. Pro., 65, 1854.
Reeve's Conch. Icon. Monog. Mactra, f. 95, 1854.
Luzon, Philippines.

54. **T. ornata**, Gray, An. and Mag. Nat. Hist., 371, 1837.
Reeve's Conch. Icon. Monog. Mactra, f. 58, 1854. *China Seas.*
55. **T. Petitii**, d'Orbigny, Voy. dan l'Am. Moll., 509, pl. 77,
f. 23, 24. *Brazil.*
56. **T. polita**, Chemnitz, vi. 222, f. 216, 217.
T. glabrata, Schroöter.
T. Australis, Lam., An. s. Vert., vi. 101, 1835. *Australia.*
57. **T. pulchra**, Gray, An. and Mag. Nat. Hist., 372, 1837.
Reeve's Conch. Icon. Monog. Mactra, f. 60, 1854. *Red Sea.*
58. **T. pura**, Deshayes, Zool. Pro., 15, 1853.
Reeve's Conch. Icon. Monog. Mactra, f. 53, 1854. *Australia.*
59. **T. pusilla**, A. Adams, Zool. Pro., 226, 1855.
Moreton Bay.
60. **T. quadrangularis**, Deshayes, Zool. Pro., 15, 1853.
Reeve's Conch. Icon. Monog. Mactra, f. 3, 1854. *China.*
61. **T. radiolata**, Deshayes, Zool. Pro., 65, 1854.
Reeve's Conch. Icon. Monog. Mactra, f. 91, 1854.
Zebu, Philippines.
62. **T. Reevei**, Deshayes, Zool. Pro., 11, 1853.
New Caledonia.
63. **T. rufescens**, Lam., An. sans Vert. (Desh. ed.). vi. 102,
1835. *Australia.*
64. **T. Sauliana**, Gray, An. and Mag. Nat. Hist., 29, 1838.
Reeve's Conch. Icon. Monog. Mactra, f. 68, 1854.
65. **T. scalpellum**, Deshayes, Zool. Pro., 65, 1854.
Reeve, Conch. Icon. Monog. Mactra, f. 106, 1854.
New Zealand.
66. **T. semistriata**, Deshayes.
Reeve's Conch. Icon. Monog. Mactra, f. 55, 1854.
67. **T. semisulcata**, Deshayes.
Reeve's Conch. Icon. Monog. Mactra, f. 48, 1854.
Australia.
68. **T. sericea**, Deshayes, Zool. Pro., 65, 1854.
Reeve, Conch. Icon. Monog. Mactra, f. 10, 1854.
69. **T. Splengleri**, Linn., Syst. Nat. (12th ed.), 1125.
Reeve's Conch. Icon. Monog. Mactra, f. 40, 1854.
Cape of Good Hope.

70. **T. stultorum**, Linn., Syst. Nat. (12th ed.), 1126.
Cardium, Linn., (10th ed.)
Tellina radiata, Pennant. *Europe.*
71. **T. subrostrata**, Deshayes.
 Reeve's Conch. Icon. Monog. Mactra, f. 25, 1854. *Moluccas.*
72. **T. sulcataria**, Deshayes, Zool. Pro., 15, 1853.
 Reeve's Conch. Icon. Monog. Mactra, f. 5, 1854.
73. **T. symmetrica**, Deshayes, Zool. Pro., 17, 1853.
 Reeve's Conch. Icon. Monog. Mactra, f. 84, 1854. *New Caledonia.*
74. **T. tristris**, Deshayes, Zool. Pro., 69, 1854.
 Reeve's Conch. Icon. Monog. Mactra, f. 69, 1854. *Moreton Bay, Australia.*
75. **T. veneriformis**, Deshayes, Zool. Pro., 15, 1853.
 Reeve's Conch. Icon. Monog. Mactra, f. 2, 1854. *China Sea and Japan.*
76. **T. violacea**, Chemnitz, Conch. Cab., vi. 220, f. 213, 214, 1782.
 Reeve's Conch. Icon. Monog. Mactra, f. 57, 1854. *Malacca.*
77. **T. virgo**, Deshayes, Zool. Pro., 66, 1854.
 Reeve's Conch. Icon. Monog. Mactra, f. 63, 1854. *China.*

Sub-family LUTRARIINÆ.

GENUS **HETEROCARDIA**, Deshayes.

1. **H. Cumingii**, Deshayes, Proc. Zool. Soc. 339, 1854. *Manilla.*
2. **H. fabagella**, Deshayes, Proc. Zool. Soc. 340, 1854. *Philippines.*
3. **H. gibbosula**, Deshayes, Proc. Zool. Soc. 340, 1854. *Manilla.*

GENUS **ANATINELLA**.

1. **A. candida** (*Mya*), Chemnitz, Conch. Cab. vi. 29, f. 17, 18, 1782.
2. **A.^s dilatata**, A. Adams, Proc. Zool. Soc. 41, 1850. *Philippines.*
3. **A. ventricosa**, A. Adams, Proc. Zool. Soc. 41, 1850. *Philippines.*

GENUS **CÆCELLA**, Gray.

1. **C. Chinensis**, Deshayes, Proc. Zool. Soc. 334, 1854.
Chinese Seas.
2. **C. convexa**, Deshayes, Proc. Zool. Soc. 334, 1854.
3. **C. Cumingiana**, Deshayes, Proc. Zool. Soc. 334, 1854.
Philippines.
4. **C. lata**, Deshayes, Proc. Zool. Soc. 334, 1854.
Chinese Seas.
5. **C. oblonga**, Deshayes, Proc. Zool. Soc. 335, 1854.
Chinese Seas.
6. **C. tenuis**, Deshayes, Proc. Zool. Soc. 336, 1854.
Philippines.
7. **C. transversalis**, Deshayes, Proc. Zool. Soc. 335, 1854.
8. **D. turgida**, Deshayes, Proc. Zool. Soc. 333, 1854.
Philippines.
9. **C. Zebuensis**, Deshayes, Proc. Zool. Soc. 334, 1854.
Philippines.
10. **C. Zelandica**, Deshayes, Proc. Zool. Soc. 335, 1854.

GENUS **RAETA**, Gray.

1. **R. canaliculata** (*Lutraria*), Say, Jour. Acad. Nat. Sci. ii. 310, 1821. (Binney's ed. 102).
Maetra canaliculata, Reeve, Conch. Icon. Monog. Maetra, f. 122, 1854.
M. Campechensis, Gray. Wood, Index Test. Sup. f. 3, 1818.
Georgia, South Carolina.
2. **R. lyrata**, Hinds.
3. **R. papyracea**, Chemnitz, Conch. Cab. vi. 233, f. 230, 1782.
4. **R. pellicula**, Deshayes, Reeve, Conch. Icon. Monog. Maetra, f. 124, 1854.
Japan.
5. **R. pulchella**, Adams and Reeve, Genera, ii. 386, 1858.
6. **R. rostralis**, Deshayes, Zool. Proc. 69, 1854.
Reeve, Conch. Icon. Monog. Maetra, f. 119, 1854.
China Seas?
7. **R. tenera**, Deshayes.
Reeve, Conch. Icon. Monog. Maetra, f. 123, 1854.

8. **R. tenuis**, Hinds.

H. and A. Adams, Genera, ii. 386, 1858.

9. **R. undulata**, Gould, Proc. Bost. Soc. Nat. Hist. iv. 89, 1851.

Bost. Jour. Nat. Hist. vi. pl. 15, f. 7, 1853.

*La Paz, Lower California.*GENUS **LABIOSA**, Schmidt.1. **L. anatina**, Spengler, Skrivt. Nat. Hist. Selsk. v. 120, 1799.*Mactra anatina*, Spengler.2. **L. cyprina**, Gray. Wood, Index Test. pl. 1, f. 1, 1818.

Reeve, Conch. Icon. Monog. Mactra, f. 37, 1854.

3. **L. lineata**, Say, Jour. Acad. Nat. Sci. ii. 310, 1821.

Amer. Conch., Binney's ed., 102, 158, pl. 9.

Mactra Nuttallii, Reeve (not *Lutraria Nuttallii*, Conrad),
Conch. Icon. Monog. Mactra, f. 125, 1854.*Mactra recurva*, Wood, Index Test. Sup. f. 2.*South Carolina.*4. **L. papyracea**, Lam., An. sans Vert. (Desh. ed.) vi. 93, 1835.

Sowerby's Genera, f. 2, 1847.

5. **L. ventricosa**, Gould, Proc. Bost. Soc. Nat. Hist. iv. 89, 1851.

Bost. Jour. Nat. Hist. vi. 390, 1853.

*Mazatlan.*GENUS **VANGINELLA**, Gray.1. **V. Taylorii**, Gray.*Resania lanceolata*, Gray, MSS. Reeve, Conch. Icon. Monog.
Lutraria, f. 17, 1854. *New Zealand.*GENUS **ZENATIA**, Gray.1. **Z. acinaces**. Quoy.Reeve, Conch. Icon. Monog. *Lutraria*, f. 14, 1854.*New Zealand.*2. **Z. Cumingiana**, Deshayes, Zool. Proc. 14, 1854.Reeve, Conch. Icon. Monog. *Lutraria*, f. 13, 1854.*New Zealand.*3. **Z. Solenoides**, Deshayes, Zool. Proc. 72, 1854.*Lutraria Deshayesii*, Reeve, Conch. Icon. Monog. *Lutraria*, f.
1, 1854. *New Zealand.*

GENUS **LUTRARIA**, Lam.

An. s. Vert. vi., 88, 1835.

1. **L. arcuata**, Deshayes, Zool. Proc., 70, 1854.
Reeve, Conch. Icon. Monog. Lutraria, f. 6, 1854.
Luzon, Philippines.
2. **L. Australis**, Deshayes, Zool. Proc., 71, 1854.
Reeve, Conch. Icon. Monog. Lutraria, f. 12, 1854.
Australia.
3. **L. Capensis**, Deshayes, Zool. Proc., 71, 1854.
Reeve, Conch., f. 9. *Cape of Good Hope.*
4. **L. curta**, Deshayes, Zool. Proc., 71, 1854.
Reeve, Conch. Icon. Monog. Lutraria, f. 5, 1854.
Philippines.
5. **L. dissimilis**, Deshayes, Zool. Proc., 72, 1854.
Reeve, Conch. Icon. Monog. Lutraria, f. 8, 1854.
Australia.
6. **L. elongata**, Gray, Mag. Nat. Hist., 374, 1837.
Reeve, Conch. Icon. Monog. Lutraria, f. 2, 1854.
7. **L. impar**, Deshayes, Zool. Proc., 70, 1854.
Reeve, Conch. Icon. Monog. Lutraria, f. 10, 1854.
Moreton Bay, Australia.
8. **L. intermedia**, Deshayes, Zool. Proc., 71, 1854.
Madagascar.
9. **L. lucida**, Gould, Proc. Bost. Soc. Nat. Hist., viii., 29, 1862.
Kagosima.
10. **L. lutraria**, Linn., Syst. (12th ed.), 1126, 1767.
Macra elliptica, Lam., An. sans Vert., (Desh. ed.), vi., 90, 1835.
Reeve, Conch. Icon. Monog. Lutr., f. 3, 1854.
Macra lutraria, Dillwyn. *European Ocean, European Seas.*
11. **L. maxima**, Jonas, Reeve, Conch. Icon. Monog. Lutraria, f. 11, 1854.
Lutraria larga, Reeve. *China.*
12. **L. oblonga**, Gmelin, Reeve, Conch. Icon. Monog. Lutr., 453, f. 7, 1854.
Mya oblonga, Gmel., Syst. Nat.
Lutraria solenoides, Lam.
Macra hians, Solander, Dillwyn. *European Seas.*
13. **L. Philippinarum**, Deshayes, Zool. Proc., 71, 1854.
Reeve, Conch. Icon. Monog. Lutraria, f. 4, 1854. *Luzon.*

14. **L. planata**, Chemnitz, Conch. Cab., vi., 238, f. 258, 259.
Mactra complanata, Gmelin, 3261.
M. oblongata, Solander, 1786.
Indian Ocean, Tranquebar, Nicobar.
15. **L. rhynchoëna**, Jonas, Reeve Conch. Icon. Monog. Lutraria, f. 16, 1854.
Swan River.
16. **L. Senegalensis**, Gray, Loudon's Mag. Nat. Hist., 374, 1837.
Senegal.
17. **L. Seiboldtii**, Deshayes, Zool. Proc., 71, 1854.
 Reeve, Conch. Icon. Monog. Lutraria, f. 15, 1854.
Vancouver's Island.

GENUS **EASTONIA**, Gray.

1. **E. rugosa**, Chemnitz, Conch. Cab., vi., 236, pl. 24, f. 236, 1782.
 Gmelin, 3261. Reeve, Conch. Icon. Monog. Mactra, f. 115, 1854.
Mactra rugosa, Chemn., Gmel., Conch. Cab., vi., 236, 1782.
Guinea.

GENUS **SPISULA**, Gray.

Loudon's Mag. N. H. new ser. i. 370, 1837.

Standella, Gray.

Loudon's Mag. Nat. Hist. 1837.

1. **S. Adelaidæ**, Angus., Zool. Proc. 645, 1865. *Australia.*
2. **S. bilineata**, C. B. Adams, Reeve, Conch. Icon. Monog. Mactra, f. 72, 1854. *Jamaica.*
3. **S. Californica**, Conrad, Jour. Acad. Nat. Sci. vii. 240, pl. 18, f. 12, 1834. *Near Santa Barbara.*
4. **S. catilliformis**, Conrad, Amer. Jour. Conch. iii. 1867.
5. **S. depressa**, Spengler, Skriv. Nat. Selsk. v. 118, 1799.
 Reeve, Conch. Icon. Monog. Mactra, f. 64, 1854.
Australia.
6. **S. dolabriformis**, Conrad, Amer. Jour. Conch. iii. 1867.
7. **S. elongata**, Quoy, Voy. Astrolabe, Zool. iii. 518, pl. 83, f. 1, 2, 1834.
 Reeve, Conch. Icon. Monog. Mactra, f. 43.
Spisula elongata, Gray, Loudon's Mag. Nat. Hist. 376, 1837.
New Zealand.

8. **S. fragilis**, Chemnitz, Conch. Cab. vi. 236, pl. 24, f. 235, 1782.

Reeve, Conch. Icon. Monog. Mactra, f. 47, 1854.

Mactra Braziliانا, Lam., An. s. Vert. vi. 106, 1835.

M. oblonga, Say, Jour. Acad. Nat. Sci. Phila. ii. 310, 1821.

Spisula fragilis, Gray, Loudon's Mag. Nat. Hist. 1837.

Honduras, Florida.

Sub-genus MACTROMERIS.

9. **S. ovalis**, Gould, Amer. Jour. Sci. (2d ser.) xxxviii. 196, 1840.

Inverteb. of Mass. 53, f. 32, 1841.

S. ponderosa, Philippi, Abbild. iii. 1845.

S. similis, Gray, not Say.

S. grandis, Deshayes, not Chemnitz.

10. **S. ovata**, Gray, Fauna of New Zealand, 251, 1843.

Reeve, Conch. Icon. Monog. Mactra, f. 30, 1854.

Spisula ovata, Gray, Loudon's Mag. Nat. Hist. 1837.

New Zealand.

11. **S. planulata**, Conrad, Jour. Acad. Nat. Sci. vii. 240, 1834.

Sta. Barbara.

12. **S. Sayi**, Gray, Mag. Nat. Hist. 373, 1837.

Spisula Sayi, Gray.

Florida.

13. **S. silicula**, Deshayes, Zool. Proc. 69, 1854.

Reeve, Conch. Icon. Monog. Mactra, f. 108, 1854.

Luzon, Philippines.

14. **S. striatella**, Lam., An. sans Vert. vi. (Desh. ed.) 98, 1835.

Reeve, Conch. Icon. Monog. Mactra, f. 12, 1854.

15. **S. velata**, Philippi, Zeits. f. Malak. 153, 1848.

Abbild. iii. 137, pl. 3, f. 5, 1845. Reeve, Conch. Icon.

Monog. Mactra, f. 20, 1854.

Panama.

Sub-genus MEROPE, H. and A. Adams.

16. **S. Ægyptiaca**, Chemnitz, Conch. Cab., ii., 218, pl. 200, f. 1955-6.

Reeve, Conch. Icon. Monog. Mactra, f. 112, 1854.

17. **S. Anatinoides**, Reeve, Conch. Icon. Monog. Mactra, f. 123, 1854.

18. **S. capillacea**, Deshayes, Zool. Proc., 69, 1854.

Reeve, Conch. Icon. Monog. Mactra, f. 117, 1854.

Philippines, and mouth of Indus.

19. **S. Deshayesii**, Conrad.*Mastra Californica*, Deshayes, Zool. Proc., 68, 1854.

Reeve, Conch. Icon. Monog. Mastra, f. 114, 1854.

*Gulf of California.*20. **S. Nicobarica**, Gmelin, Syst. Nat., 3261.*Nicobar Islands.*21. **S. pellucida**, Chemnitz, Conch. Cab., vi., 235, pl. 26,
f. 234. 1782.

Reeve, Conch. Icon. Monog. Mastra, f. 118, 1854.

Mastra depressa, Lam., An. s. Vert., vi., 108, 1835.*Bay of Manilla*22. **S. plicatilis**, Deshayes, Zool. Proc., 69, 1854.

Reeve, Conch. Icon. Monog. Mastra, f. 121, 1854.

*Philippines.*23. **S. Senegalensis**, Philippi, Zeits. für Malak., 27, 1849.Reeve, Conch. Icon. Monog. Mastra, f. 120, 1854. *Senegal.*24. **S. Solanderi**, Gray, Mag. Nat. Hist., 373, 1837.

Reeve, Conch. Icon. Monog. Mastra, f. 113, 1854.

*Moluccas.*25. **S. Thraciodes**, Adams and Reeve, Zool. Voy. Lamarang,
Moll., 81, pl. 23, f. 8, 1848.

Reeve, Conch. Icon. Monog. Mastra, f. 116, 1858.

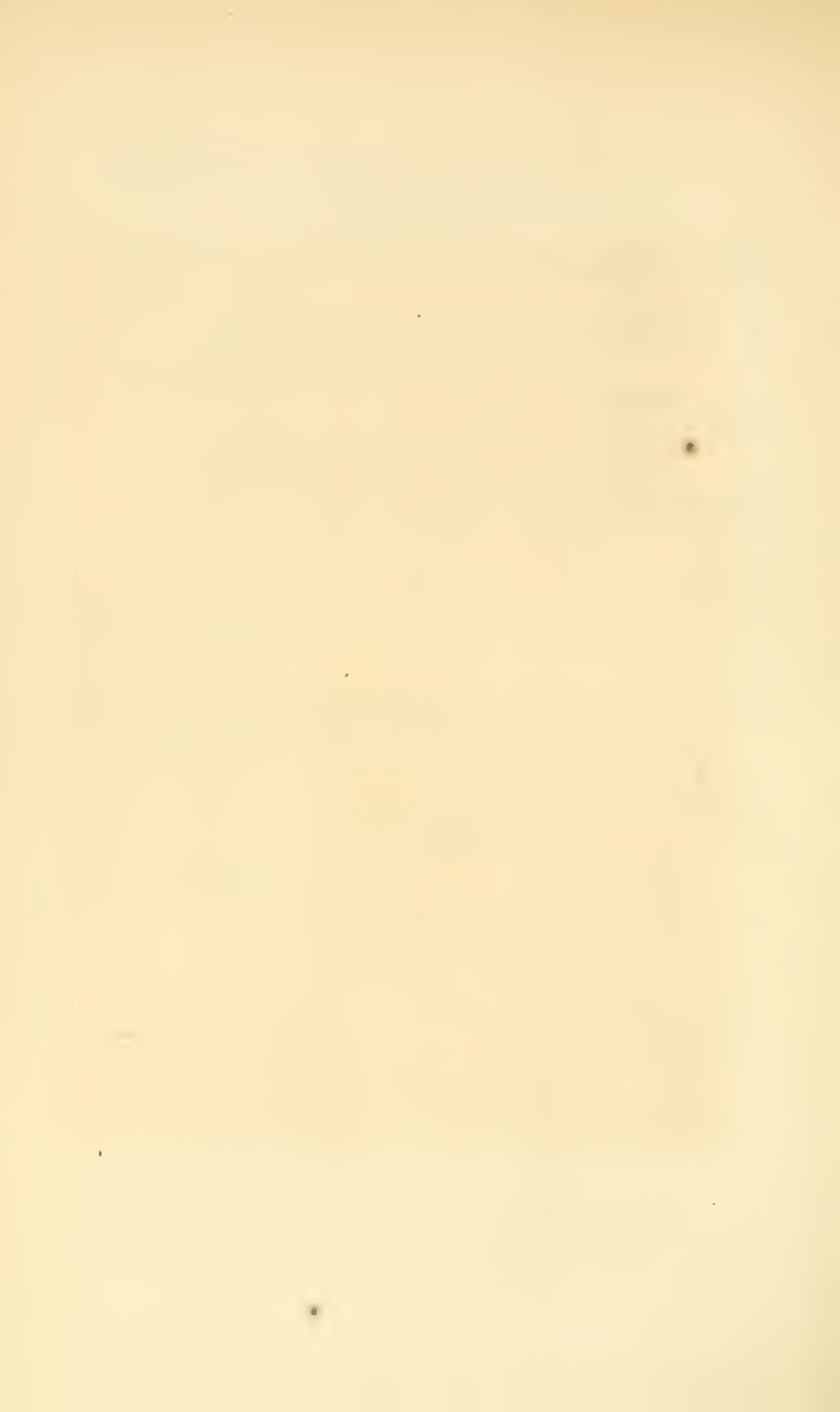
*Eastern Seas.*GENUS **DARINA**, Gray.1. **D. Solenoides**, King.GENUS **SHIZOTHÆRUS**, Conrad.

Proc. Acad. Nat. Sci. 199, 1852.

1. **S. Nuttallii** (*Cryptodon*), Conrad, Jour. Acad. Nat. Sci. vii.
235, pl. 18, f. 1, 1837. *Sta. Barbara.*GENUS **TRESUS**, Gray, 1849.1. **S. maximus** (*Lutraria*). Middendorf, Malac. Zool. Russ. pt.
3, 66, pl. 19, f. 1—4, 1843.*L. inflata*, Dunker.*Mastra maxima*, Reeve, Conch. Icon. Monog. Mastra, f. 4,
1854. *California.*

*Genera undetermined.*GENUS **MACTRA**, Linn.

- M. amygdala**, Crosse and Fischer, Jour. de Conch. iv. 3d ser. 349, 1864. *Australia.*
- M. æquilateralis**, Deshayes, Zool. Proc. 17, 1853.
Reeve, Conch. Icon. Monog. Mactra, f. 14, 1854. *New Zealand.*
- M. angulifera**, Deshayes, Zool. Proc. 70, 1854. *Philippines.*
- M. Cumingiana**, Petit, Jour. Conch. iv. 359, pl. 12, f. 1, 2, 1853. *Mouth of the Gambia River, Africa.*
- M. pulchella**, Philippi, Abbild. ii. 71, pl. 2, f. 3, 1845. *China.*



AMERICAN
JOURNAL OF CONCHOLOGY.
NEW SERIES.

PUBLISHED BY THE

CONCHOLOGICAL SECTION of the Academy of Natural Sciences of Philadelphia

VOL. III.

1867.

No. 4.

Meeting August 1st, 1867.

Donations to the Museum and Library were read.

The following papers were offered for publication in the Journal, and referred to committees :

Reviews and Notices of New Conchological Works. By Geo. W. Tryon, Jr.

Notes on the remarks of Dr. P. P. Carpenter, on certain Species of Marine Gasteropoda named by Wm. Harper Pease ; and Descriptions of New Species of Land Shells, inhabiting Polynesia. By Wm. Harper Pease.

The death of Mr. August Rémond, of California, late a Correspondent of the Section, was announced.

Meeting September 5th, 1867.

Seven members present.

MR. TRYON, Vice-Director, in the Chair.

Donations to the Museum and Library were read.

The following papers were read and referred to Committees:

Catalogue of the Families Mactridæ and Solenidæ. By T. A. Conrad.

Descriptions of two Species of Cephalopods. By S. B. Howell, M. D.

Thirty-eight gentlemen were elected Correspondents of the Section. (*See Appendix.*)

Meeting October 3d, 1867.

Donations to the Museum and Library were read.

The death of Joshua Alder, of England, late a Correspondent of the Section, was announced.

Mr. G. W. Tryon, Jr., presented the following paper, which was referred to a Committee: "Monograph of the Terrestrial Mollusca of the United States, continued."

A communication was read from Mr. Tryon, depositing his entire Conchological collection in the Museum of the Academy, subject to the control of this Section. The collection embraced about 10,000 species, including over 100,000 mounted specimens.

Mr. A. O. Currier, of Grand Rapids, Michigan, was elected a Correspondent.

Meeting November 7th, 1867.

Seven members present.

Donations to the Museum and Library were read.

The following papers, intended for publication in the Journal, were read and referred to Committees.

Descriptions of New Species of American Miocene Shells, &c. By T. A. Conrad.

Descriptions of New Species of Marine Gasteropoda inhabiting Polynesia. By Wm. Harper Pease.

Mr. Cope made some observations on *Mesodon major*, Binney. He had found it abundantly on the summits of the Salt Pond and neighboring ridges in Giles and Bland Counties, Virginia, being a much more northern habitat than hitherto observed in

the Alleghany region. He said that it was often found climbing the forest trees. It did not occur in the deeper valleys and lower country of the same region, and co-existed with the *M. albolabris*. The latter, he said, was very abundant in the same localities, and maintained its distinctive characters perfectly, though large specimens were more common there than in the neighborhood of Philadelphia.

Mr. S. R. Roberts exhibited a specimen of *Conus prometheus*, presented to the Academy many years since by Mr. John Cassin. The shell is of interest on account of its immense size, being 8 inches in length, and four inches and eight lines in diameter.

Meeting, December 5th, 1867.

Eight members present.

MR. LEA, Director, in the Chair.

Various donations to the Museum and Library were read.

The following papers were offered for publication :

Descriptions of New Species of American Miocene Shells, by T. A. Conrad.

Notices and Reviews of New Conchological Works, by Geo. W. Tryon, Jr.

Osbert Salvin, of London, was elected a Correspondent.

The annual reports of the Recorder, Secretary, Librarian, Conservator, Treasurer and Publication Committee, were read and referred for publication. (*See Appendix.*)

The following Officers and Committees were elected to serve for the ensuing year.

OFFICERS.

Director—ISAAC LEA, LL.D.

Vice-Director—GEO. W. TRYON, JR.

Recorder—S. R. ROBERTS.

Treasurer—WM. L. MACTIER.

Secretary—REV. E. R. BEADLE.

Conservator—E. J. NOLAN, M. D.

COMMITTEES.

1. *Library.*

E. J. NOLAN, M.D., Librarian, GEO. W. TRYON JR., Editor,
 JOS. JEANES, ISAAC LEA,
 GEO. W. TRYON, JR. E. J. NOLAN, M.D.

2. *Publication.*

3. *Finance.*

W.S.W. RUSCHENBERGER, Ch'n
W. S. VAUX,
JOSEPH JEANES.

8. *Fluviatile Gasteropoda.*

C. M. WHEATLEY, Ch'n,
S. S. HALDEMAN,
GEO. W. TRYON, JR.

4. *Embryology and Anatomy.*

JOS. LEIDY, M.D., Ch'n,
E. D. COPE,
S. B. HOWELL, M.D.

9. *Fluviatile Acephala.*

ISAAC LEA, Ch'n,
WM. L. MACTIER,
CHAS. M. WHEATLEY,

5. *Cephalopoda, Pteropoda and Brachiopoda.*

S. B. HOWELL, M.D., Ch'n,
T. A. CONRAD,
G. W. TRYON, JR.

10. *Marine Gasteropoda.*

S. R. ROBERTS, Ch'n,
C. F. PARKER,
JOHN FORD.

6. *Terrestrial Mollusca, (non-operculate.*

GEO. W. TRYON, JR.,
WM. G. BINNEY,
C. F. PARKER.

11. *Marine Acephala.*

T. A. CONRAD, Ch'n,
JOHN S. PHILLIPS,
SAML. LEWIS, M.D.

7. *Terrestrial Mollusca, (operculate.)*

JOHN H. REDFIELD, Ch'n,
E. R. BEADLE,
WM. L. MACTIER.

12. *Palaeontology.*

F. V. HAYDEN, M.D., Ch'n,
T. A. CONRAD,
E. D. COPE.

13. *Lectures and Prizes.*

JOSEPH LEIDY, M.D., Ch'n,
W. S. W. RUSCHENBERGER, M.D.,
ISAAC LEA.

DESCRIPTIONS OF NEW GENERA AND SPECIES OF MIOCENE SHELLS, WITH NOTES ON OTHER FOSSIL AND RECENT SPECIES.

BY T. A. CONRAD.

CYLICHNA, Forbes and Hanley.

C. VIRGINICA, Conrad.—Pl. 21, fig. 2.

Description.—Narrow-cylindrical; shoulder slightly rounded; spire slightly prominent, sides straight; apex exserted; labrum slightly contracted or nearly straight in the middle; aperture gradually widening from the summit; columellar plait distinct and rather thick.

Locality.—Virginia.

Observation.—This is a narrow, more graceful species in outline than *C. cylindracea* (*Tornatina*) Emmons, a Miocene species of N. Carolina. Say has described a recent species, *C. canaliculata* (*Bullina*) Say.

ZIZYPHINUS, Leach, Gray, 1840.

Calliostoma, Swainson, 1840.*Z. PUNCTATUS*, Conrad —Pl. 21, fig. 5.

Description.—Depressed-conical; periphery rounded; base slightly convex; umbilicus small, minutely carinated on the margin; whorls 5, with straight sides; body whorl slightly concave laterally; spire equal to base; shell with unequal impressed, punctate lines.

Locality.—Virginia?

The specimen described is in the cabinet of the Smithsonian Institution.

Z. BRIANII, Conrad.—Pl. 21, fig. 9.

Description.—Conical-depressed ; with smooth convex whorls ; periphery acutely rounded ; base flat ; umbilicus small, nearly filled with a deposit on the reflexed lip ; base with very minute revolving lines.

Locality.—Charles Co., Md.

I am indebted to Prof. Cope for this species, who obtained it and suggested that it be named in compliment to Oliver N. Brian.

TURRITILLIDÆ.

TURRITELLA, Lamarek.

T. BIPERTITA, Conrad.—Pl. 21, fig. 1.

Proceed. Acad. Nat. Sci., vol. i, p. 326.

Locality.—Petersburg, Va.

T. INDENTA, Conrad.—Pl. 21, fig. 13.

Description.—Broad at base ; whorls each with two revolving obtuse lines, the inferior one largest, subtuberculated and margins the suture, and an impressed line marks its upper margin ; the other revolves on the upper margin of the whorls ; suture profoundly excavated, sides of volutions slightly concave ; revolving lines rugose, minute.

T. indenta, Conrad.—Journ. Acad. Nat. Science, vol. viii., p. 188.

Locality.—Calvert Cliffs, Md.

Professor Cope obtained numerous specimens of this hitherto rare species, one of which is represented in the figure. There are three species with this remarkable excavation of the suture. *Turritella secta*, Conrad, is the third, a small species from the Eocene of Maryland, but the most deeply impressed of the group.

NATICIDÆ.

LUNATIA, Gray.

L. CATENOIDES ? Pl. 23, fig. 5.

Natica catenoides, Wood.

This is probably the young of *N. catenoides*, a very abundant species in the bank of St. Mary's River, Md.

NATICA, Lam.

N. PLICATELLA, Conrad.—Pl. 24, fig. 3.

N. canrena, Conrad (not Lam.), Amer. Jour. of Science and Arts, vol. xli. p. 344.

NEVERITA, Risso.

N. EMMONSII.—Pl. 24, fig. 2.

Thick ; spire depressed ; umbilicus perfectly closed by a thick rugose callus.

Natica — Emmons. Geol. of N. Carolina, p. 267, fig. 151.

N. DENSATA. Pl. 24, fig. 5.

Description.—Ovate, thick, prominent and pyramidal by compression of the whorls ; surface marked by very minute obsolete revolving lines ; umbilicus nearly closed by a thick rugose callus.

Natica duplicata, Conrad (not Say), Emmons, Geol. of North Carolina, p. 266, fig. 150.

MELANIIDÆ.

MELANOPSIS, Ferussac.

The three species of a genus which I supposed to be marine and named *Bulliopsis*, are probably fresh water shells of the genus *Melanopsis*. These and one species of *Vivipara* are all the fresh water shells yet found in the Atlantic slope Miocene.

M. Marylandica, *M. quadrata*, and *M. integra*. See vol. ii., p. 65 of this Journal.

CASSIDÆ.

SEMICASSIS, Klein.

S. CÆLATA.—Pl. 21, fig. 3.

Journal of the Acad. Nat. Science, Vol. vi., p. 218, pl. 9, fig. 14.

This is a very rare shell of a genus unknown on the Atlantic coast, the species chiefly inhabiting the eastern seas.

SCALARIDÆ.

SCALARIA, Lam.

Subgenus *STHENORYTIS*, Conrad.

S. PACHYPLEURA.—Pl. 21, fig. 4.

Description.—Short, conical, whorls 8 ; spire acuminate ;

body whorl very large comparatively, the ribs thick, acuminate at the summit, prominent, profoundly recurved; aperture nearly round, with a thick margin.

S. pachypleura, Conrad. Journ. Acad. Nat. Science, Vol. viii., 1862, p. 565.

Locality.—Calvert Cliffs, Md.

Observation.—I found one specimen, very perfect, but the figure represents a specimen presented to the Academy by Professor Cope. This and the fragment of another were all he obtained in a large collection of Miocene fossils from Charles Co., Md.

ARCHITECTONICIDÆ.

ARCHITECTONICA, Bolten.

Solarium, Lam.

A. TRILINEATA.—Pl. 20, fig. 5.

Description.—Depressed conical, whorls 5, convex, an impressed revolving line below the suture and a raised line above the suture slightly crenulated; on the 3 upper whorls a crenulated line runs in the impressed or canaliculate sutural space; body whorl carinated and crenulated on the periphery, above which runs another broader, less prominent crenulated line with a concave canal between them, and 5 or 6 obsolete revolving lines above; whorls crenulated at the upper sutural line and striated obliquely; base flattened, with a prominent revolving line near the periphery and near it an obsolete line; umbilicus wide, crenulated on the margin and margined by a deeply impressed line.

Locality.—Calvert Cliffs, Md.

A. trilineata, Conrad. Journal Acad. Nat. Science, Vol. viii., p. 186.

A. NUPERA.—Pl. 19, fig. 8.

Description.—Discoidal; spire slightly convex, flat in young shells; suture canaliculated; whorls with close, unequal crenulated revolving lines, one on the periphery, another near it and one on the summit of the whorls larger than the others; base convex, with 10 crenulated revolving lines, three or four most prominent; the one nearest the umbilicus largest and crenate; umbilicus moderately wide.

Solarium nuperum, Conrad. Journ. Acad. Nat. Science, vol. vii., p. 141.

Locality.—Suffolk, Va.

Observation.—Species of this genus chiefly inhabit the eastern seas.

DACTYLIDÆ.

DACTYLUS, Klein.

D. IDONEUS, Conrad.—Pl. 22, fig. 1.

Amer. Jour. of Arts and Science, vol. xli., p. 344. Proceed. Acad. Nat. Science, 1863, p.

Locality.—National Well, Dauphin Co., N. C.

A beautiful species of *Dactylus* lives in great abundance in Tampa Bay, Florida, very closely allied to the Miocene fossil *D. carolinenses*, Conrad. There is no other large recent species on the Atlantic or Florida coasts, but there are in all four Miocene species over $1\frac{1}{4}$ inches in length.

D. EBOREUS, Conrad.—Pl. 21, fig. 11.

S. eborea.—Proc. Acad. Nat. Science, 1862, p. 287.

Locality.—Virginia.

PLEUROTOMIDÆ.

BELLASPIRA, Conrad.

Description.—Subfusiform, longitudinally ribbed; canal very short, labrum obsoletely and widely notched, curved outwards, simple; labium reflexed, entire; columella straight.

C. VIRGINIANA.—Pl. 21, fig. 12.

Mungelia virginiana, Conrad.—Proceed. Acad. Nat. Science, 1862, p. 286.

Locality.—Yorktown, Va.

Observation.—This shell does not agree in characters with any of the genera or subgenera of Pleurotomidæ. It is a beautiful and graceful shell with distant ribs and very minute, close revolving lines, which become gradually more distinct on the body whorl. The labium is slightly callous near the upper extremity.

Family BUCCINIDÆ.

Subfamily NASSINÆ.

PTYCHOSALPINX, Gill.*

Dr. Gill has published the diagnosis of a group of Miocene fossil shells which he observes is related to *Buccinum*, but it obviously comes within the subfamily Nassinæ, and is much more nearly related to *Nassa* or *Tritia*. The general thickness

*Jour. Conch., iii., p. 153, 1867.

of the shells, the narrower aperture, the downward slope of the labrum, the columella without a twist and the prominent plait at base are all characters of the Nassinæ and not of *Buccinum*. Dr. Gill in his diagnosis states that the labrum is "smooth within," and yet quotes *Buccinum porcinum*, Say, as a species, though it has prominent lines within. The fact is there are two groups, in one of which the labrum is smooth within and not thickened on the submargin as in *P. fossulata*, Con., *P. multirugata*, Con., and the other has a slightly thickened labrum near the margin and is striate within, as *Buccinum porcinum*, Say. These again are linked with *Ilyanassa*, Stimpson,* the typical species of which has a striated labrum and is not thickened, and has the plait at base very like *B. porcinum*, which plait is thicker than that of the typical species, and the shell is more elongated. This is related to *Tritia trivittata*, Say, which is still more elongated, so that it is difficult to separate all these genera or subgenera by invariable characters. I have a new Miocene shell closely related to *T. trivittata*, which has a striate labrum like that shell, whilst another, equally near to that species, *T. peralta*, Con., has the labrum entire. These genera or subgenera are all alike in having a plait at the base of the columella.

Dr. Stimpson, in his generic character of *Ilyanassa* has "inner lip smooth," but specimens which I found at Jersey City have it very distinctly striate. It will be proper to accept *Ptychosalpinx* as a genus or subgenus; if the latter, *Buccinum porcinum*, Say, will constitute the type of a subgenus. The differences may be thus stated.

PTYCHOSALPINX.—Labrum not thickened, entire; species *P. altilis*, Conrad, *P. laqueata*, Con., *P. fossulata*, Con., *P. bilix*, Con., *P. lienosa*, Con., *P. multirugata*, Con., *P. scalaspira*, Con., *P. Tuomeyi*, (*Buccinum*), H. C. Lea. *Buccinum lampas*, Brocchi is probably a species of this genus as well as *B. Escheri*, Mayer.

Subgenus *PARANASSA*, Conrad.

Description.—Shell with the submargin of labrum slightly thickened within and striate; siphonal canal shorter than in the above group. Species *Bucc. porcinum*, Say, *B. aratum*, Say, *Tritia harpuloides*, Con., *Paranassa granifera*, Con., *Tritia sexdentata*, Con., and *Buccinum elongatum*, Sowerby, an Eocene shell. This group is well represented in the environs of Dax, as may be seen in Grateloup's *Conch. Fossil*, pl. 1, fig. 4, 5, 27. The group of which *Nassa trivittata*, Say, is an example,

* Jour. Conch. i., p. 61, 1866.

referred to *Tritia* by H. and A. Adams, is also represented in that locality and species are figured by Grateloup on his plate of Buccins, fig. 16, 36, 40, and by Brocchi, pl. v., fig. 4, 9, 12. Shell elongated, comparatively small. Species, *T. trivittata*, Say; *T. varicosa*, Con.; *T. peralta*, Con.; *Buccinum quadrulatum*, H. C. Lea; *Tritia impressa*, Con. The siphonal canal as in the last group almost undefined, and the interior of the labrum either entire or striated, but not thickened.

ILYANASSA, Stimpson.

The shells of this group are often varicose, some having this character prominent, as in fig. 36 of Grateloup's Buccins. This character is also slightly developed in *Nassa obsoleta*, Say, and *P. irrorata*, Con.

I. IRRORATA.—Pl. 19, fig. 10.

Proceed. Acad. Nat. Science, 1862, p. 562.

Buccinum obsoletum. Tuomey and Holmes, (not Say.)

Distinguished by the sculpture being more prominently granulose than in that of the recent species; it is also a thicker shell with a much thicker labrum. The minute granulations on the polished inner lip of the *I. obsoleta*, are obscurely traced on the weathered lip of the fossil.

PTYCHOSALPINX, Gill.

R. SCALASPIRA.—Pl. 19, fig. 4.

Description.—Ovate; body whorl profoundly ventricose, spire scalariform, acute; ribs small, numerous, oblique, not very prominent, revolving lines obsolete on the penultimate and upper part of the body whorl; columellar fold very prominent.

Locality.—Virginia.

Collection of the Academy. One specimen.

P. LIENOSA, Conrad.—(*Tritia*), pl. 19, fig. 9.

Proceed. Acad. Nat. Science, 1843, p. 308.

Subgenus *PARANASSA*, Conrad.

P. GRANIFERA.—Pl. 19, fig. 6.

Description.—Ovate, thick, with numerous oblique granulated ribs and distinct impressed lines, about 9 on the body whorl; one or two filiform lines between the larger lines near the suture; spire short, whorls slightly turritid; aperture with 6 prominent lines within; beak earinated on the back.

Locality.—Virginia.

P. HARPULOIDES.—Pl. 19, fig. 7.

Proceed. Acad. Nat. Science. 1843, p. 308.

Locality.—Petersburg, Va.

Subgenus *TRITIARIA*, Con.

Description.—Elongated, subturrit, labrum not thickened within.

P. PERALTA.—Pl. 19, fig. 5.

Description.—Elongated, turrit, whorls 8, longitudinally ribbed and with revolving impressed lines, about 5 in number on the penultimate volution; above near the suture on all the whorls there is a broader impressed line, which divides the ribs and forms a tuberculous ridge around the summits of the whorls; ribs narrow, numerous; spire acuminate.

T. trivittata, Conrad, (not Say.) Proceed. Acad. Nat. Science, 1862, p. 562.

TRITONIIDÆ.

BURSA, Bolten, 1798.

Ranella, Lam.

B. CENTROSA.—Pl. 21, fig. 10.

Description.—Turrit, spire elevated; whorls with granulated revolving unequal lines, and a series of rounded, prominent, closely arranged nodes on the angle which is situated below the middle of the whorls; body whorl with three distant nodular revolving ribs, the lower one small; columella with transverse irregular plaits.

Locality.—Charles Co., Md. Prof. Cope.

MURICIDÆ.

BUCCINOFUSUS, Conrad.

Description.—Fusiform longitudinally undulato-costate; revolving ribs prominent, distant, narrow, with intermediate lines; columella concave, entire; siphonal canal widest at base; beak not produced, shorter than the spire, slightly recurved; labrum sulcate within; sulci corresponding to the external ribs.

FUSUS PARILIS, Conrad. Tert. Foss.

This genus contains but few species, and originated in the Miocene formation. Perhaps *Fusus sulcatus*, Lam.; may be a recent species. The form of the shell is more that of a *Fasciolaria* than a *Fusus*, but the columella is entire. There

is no recent American shell that approaches the *B. parilis*. The genus is readily distinguished from *Fusus* by its comparatively short canal, and from *Neptunea* by its longer beak and the sudden contraction of the aperture where it joins the canal. Perhaps *Buccinum Balteatum* and *B. fusoides*, Reeve, may be species of this genus. *F. Berniciensis*, King, can more confidently be referred to it.

SYCOTYPUS, Browne, Gill.

S. PYRIFORMIS.—Pl. 20, fig. 1.

Description.—Pyriform, rather thin in substance; volutions $6\frac{1}{2}$; spire prominent, exserted, not elevated; angles of whorls rather below the middle, tuberculated, the tubercles gradually becoming obsolete on the back of the penultimate volution; summits of volutions oblique, slightly concave; a carinated ridge borders the sutural margin of the three larger volutions, and between these and the apex the canal is obsolete; body whorl ventricose, slightly rounded towards the angle which is not carinated; surface marked with numerous filiform, rugose, revolving lines, between which are usually three minute lines, the middle one being most prominent; aperture wide; columella flattened about the fold.

Locality.—Natural Well, Dauphin Co., N. Car.

Observation.—This species is nearly allied to *S. pyrum*, but can be distinguished by its more prominent and distinctly tuberculated spire and by the spiral lines being filiform and rugose. The aperture is not so long in proportion as it is in *S. pyrum*.

BUSYCON, Bolten.

B. TRITONIS, Conrad.—Pl. 20, fig. 2.

This species is figured for comparison with *B. maximum* in the Miocene Fossils of the U. S., pl. 47. It is much more ventricose than that species and has very prominent spines, whilst the *maximus* is without spines, except in young shells, and they are always distant and rudimentary. A comparison of several specimens of each species shows marked differences.

B. Tritonis, Con. Proceed. Acad. Nat. Science, 1862, p. 583.

B. CARINATUM.—Pl. 19, fig. 2.

Proceed. Acad. Nat. Science, 1862, p. 286.

The specimen figured is the only one I have seen, and belongs to the collection of the Smithsonian Institution.

Pl. 20, fig. 3. Young shell of *Sycotypus canaliculatus* before exclusion from the pouches. Enlarged.

Pl. 20, fig. 4. Young of *Busycon aruanum*, enlarged.

The former shell is entire; the latter has a longitudinal fissure on the body whorl which divides the columella, and it is covered by so delicate a membrane that it is generally broken or absent. If this difference should be found to exist in all the young species of the two genera, it will confirm the generic distinction.

B. DUMOSUM.—Pl. 19, fig. 3.

Description.—Fusiform, rather thick in substance; whorls 7; slightly concave above; spire prominent, angle near the suture, carinated and tuberculated on the smaller volutions and spinous on the back of the penultimate whorl; body whorl with prominent, distant spines, not dilated at base; surface with prominent filiform revolving lines, with very minute intermediate lines, generally three in number; body whorl rather abruptly rounded or subangular inferiorly where there is a space without revolving lines, but longitudinally subcostate; beneath this space the shell has more prominent, closer rugose lines; aperture with sharp prominent lines within, terminating in irregular, more elevated and thicker rib-like lines.

B. FILOSUM, Conrad.—Pl. 21, fig. 7.

Proceed. Acad. Nat. Sciences, 1862, p. 286.

The figure represents a small specimen. It attains to $6\frac{1}{2}$ inches in length.

B. CONTRARUM, Conrad.—Pl. 23, fig. 2.

Observation.—This species has been referred to *B. perversum*, Lin., but it is greatly inferior in size, and, except in its reversed aperture, has no very near affinity with that species.

Fulgur contrarius, Conrad. American Journ. of Science and Arts, vol. xxxix. p. 387.

Busycon contrarium, Conrad. Miocene Fossils, pl. 45, fig. 11.

B. TUBERCULATUS.—Pl. 23, fig. 1.

Fulgur tuberculatus, Conrad. Bulletin of the National Institution, p. 185.

Busycon tuberculatus. Miocene Fossils, pl. 46, fig. 2.

B. FUSIFORME, Conrad.—Pl. 23, fig. 4.

Fulgur fusiformis, Conrad. Bullet. of National Inst., p. 187.
Miocene Fossils, pl. 46, fig. 3.

SYCOTYPUS, Browne.

S. EXCAVATUS, Conrad.—Pl. 23, fig. 6.

Fulgur excavatus, Conrad. Amer. Jour. of Science and Arts, vol. xxxix. p. 387. Miocene Fossils, pl. 45, fig. 3.

S. CORONATUS, Conrad.—Pl. 24, fig. 1.

Fulgur coronatus, Conrad. Bulletin of the National Institution, p. 187. Miocene Fossils, pl. 46, fig. 1.

S. RUGOSUS, Conrad.—Pl. 24, fig. 4.

Fulgur rugosus, Conrad. Proceed. Acad. Nat. Sciences, vol. i. p. 307. Miocene Fossils, pl. 46, fig. 4.

MEGANEMA, Conrad.

This genus differs from *Busycon* in being without a trace of tubercles or spines, and in having prominent regular ribs; the whorls are flattened on top, and slightly canalculated.

Proceed. Acad. Nat. Science, 1864, p. 212.

LIROSOMA CURVIROSTRA.—Pl. 19, fig. 1.

This shell was incorrectly referred to *Lirosoma*, which is more like a *Fusciolaria* with a prominent plait and straight siphonal canal, whilst *M. curvirostra* is nearly related to *sycotypus* and has a similar fold or groove on the columella.

CÆLATOCONUS, Conrad.

C. PROTRACTUS.—Pl. 20, fig. 6.

Proceed. Acad. Nat. Science, 1862, p. 566.

FASCIOLARIDÆ?

LIROSOMA.

L. SULCOSA.—Pl. 23, fig. 3.

Fusus sulcosus, Conrad. Journ. Acad. Nat. Sciences, vol. vi. p. 220, pl. 9, fig. 8.

MYTILIDÆ.

MODIOLARIA, Beck.

M. VIRGINICA.—Pl. 22, fig. 3.

Description.—Oblong, subarcuate, ventricose anterior side

without radiating lines ; umbonal slope raised, rounded with close, crenulated, radiating lines, extending to the posterior margin and disposed to bifurcate towards the base ; beaks nearly terminal.

Locality.—Yorktown, Va.

ASTARTIDÆ.

ERYCINELLA, Conrad.

E. OVALIS, Conrad.—Pl. 22, fig. 2.

Miocene Fossils, p. 42, pl. 42, fig. 5

Locality.—Yorktown, Va.

The figure represents the shell of the natural size.

MACTRIDÆ.

MACTRA, Lin.

I have followed H. and A. Adams in selecting the first species Linnæus described under the head of *Maetra*—*M. spengleri*—which was made the type of a new genus by Dr. J. E. Gray, to which he gave the name of *Scissodesma*. Where a group of genera are described as one genus, the diagnosis must necessarily be general, and therefore Linnæus did not give attention to minute characters which may nevertheless indicate some important anatomical difference. If we reject the first described species as the type of a genus we must be guided by fancy alone in making another species of the group the generic type. In this case, as few authors would agree upon the selection, inevitable confusion must follow. In *M. spengleri* there is an oblique triangular groove opening into the upper edge of the cartilage pit, which is made an essential character in distinguishing *Maetra* from *Trigonella*, *Mulina*, &c. In geographical distribution this subdivision of Linnæan genera presents remarkable and important facts. Thus only one species of true *Maetra* has been found in the waters of the Western Hemisphere—the *M. Guadeloupensis*, Recluz—whilst the others inhabit China and Africa and the eastern seas. *M. tumida*, Reeve, inhabiting St. Thomas, is not the *tumida* of Chemnitz, which inhabits China. As I have not seen the former shell I do not know that it is a *Maetra*.

M. CONTRACTA.—Pl. 22, fig. 6.

Description.—Triangular, inequilateral, subcompressed, contracted from beak to base ; anterior extremity acutely rounded ; umbonal slope carinated ; posterior hinge margin oblique, nearly straight, obliquely subtruncated above the extremity.

Locality.—N. Carolina ?

Observation.—This small species has the sagittate ligament fissure very distinct and almost as large in proportion as in *M. spengleri*.

M. VIRGINIANA.—Pl. 22, fig. 4.

American Journ. of Conch.

MULINIA, Gray.

M. PARILIS.—Pl. 22, fig. 5.

Description.—Triangular, equilateral, slightly ventricose; anterior extremity subacutely rounded; posterior hinge slope very oblique, slightly convex, extremity truncated considerably above the line of the base.

Locality.—Virginia.

ANATINIDÆ.

PANDORA, Lam.

P. arenosa Con. (*Pandorella* Con.) is a true *Pandora*, and therefore the genus *Pandorella* is eliminated.

P. crassa, Con., is a species of *Cleidiophora*, Carpenter.

CORBULIDÆ.

CORBULA, Lam.

C. CURTA. Pl. 21, fig. 6, 8.

Description.—Triangular; height rather more than the length; summits very prominent and post-medial; posterior extremity truncated, direct; sides flattened posteriorly, with an abruptly-rounded, obscurely-ridged umbonal slope.

Locality.—Charles Co., Md. Prof. Cope.

The surface of the valves is somewhat disintegrated, showing conspicuous lines as of growth, but it was probably finely lined, as I infer from the less worn portions of the larger valve.

Approximates *C. elevata*, Con., of the Calvert Miocene, but is larger, much more ventricose, shorter, and the concentric lines are much finer and less distinct.

Locality.—Charles Co., Md. Prof. Cope.

The Miocene shells from Prof. Cope, described in this paper, are part of a collection obtained in Charles Co., Md., by James J. Thomas.

CRASSATELLA, Lam.

The two species of *Crassatella*, described and figured in vol. ii., p. 104, as *C. peralta* and *C. planata* I have since found in the Cretaceous marl near Barnsboro'. They are not found in Miocene, as I supposed from the locality named on the specimens in the collection of the Academy.

Recent Species.

VENUS, Lin.

V. PULICARIA, Brod.

A specimen from Cape St. Lucas, Lower California, marked by Mr. Carpenter *pulicaria* with a mark of doubt, and labelled var. *lilacina* is in the Academy's collection. It is closely related to *V. intapurpurea*, Con., from Florida, but differs in the following characters: The ribs are thin, and fimbriated; but in the Florida shell they are thick, not fimbriated and more profoundly imbricated. It is also a comparatively shorter shell and less ventricose.

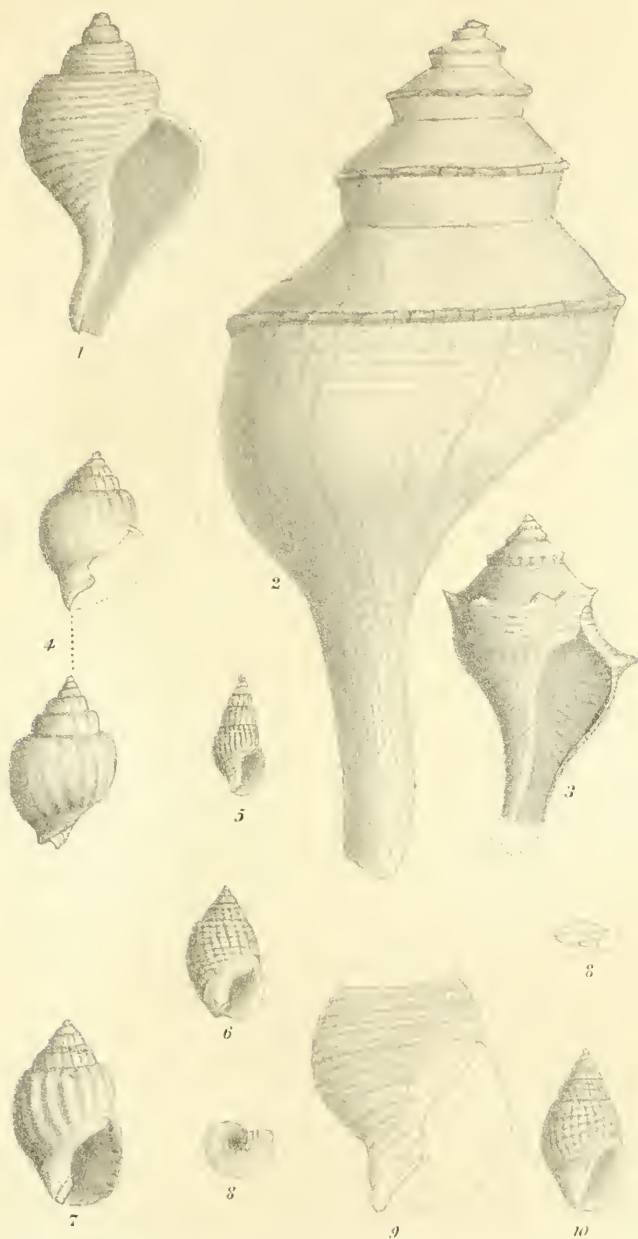
PURPURA, Lam.

PURPURA FLORIDANA, Conrad.

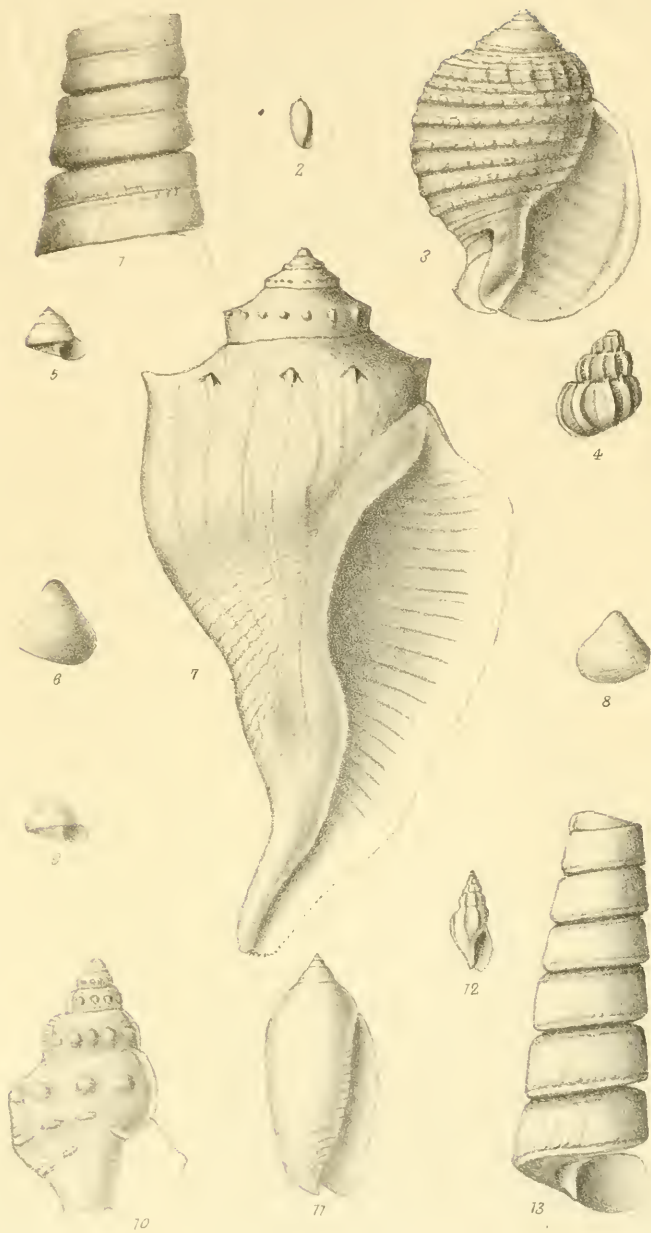
P. hæmostoma, var. Dunker not Lin. Index Moll. pl. 3, fig. 14.

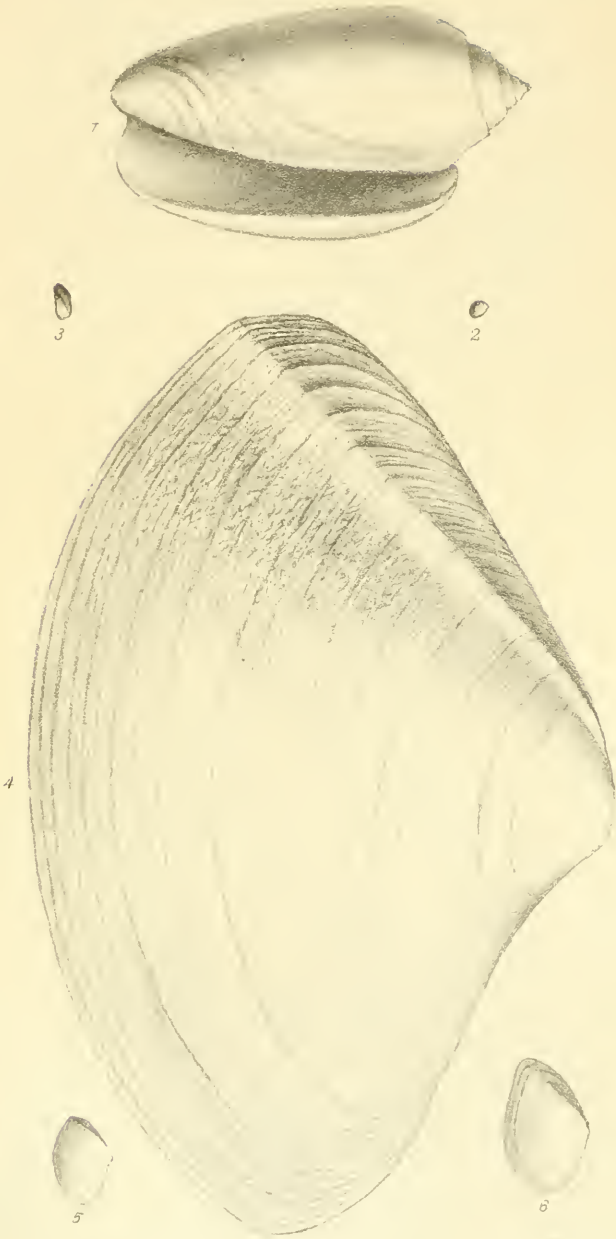
P. NEBULOSA, Conrad. Dunker, ib. fig. 15.

This species is readily distinguished by its large distant tubercles, and it is a thicker shell than the former.











270⁵



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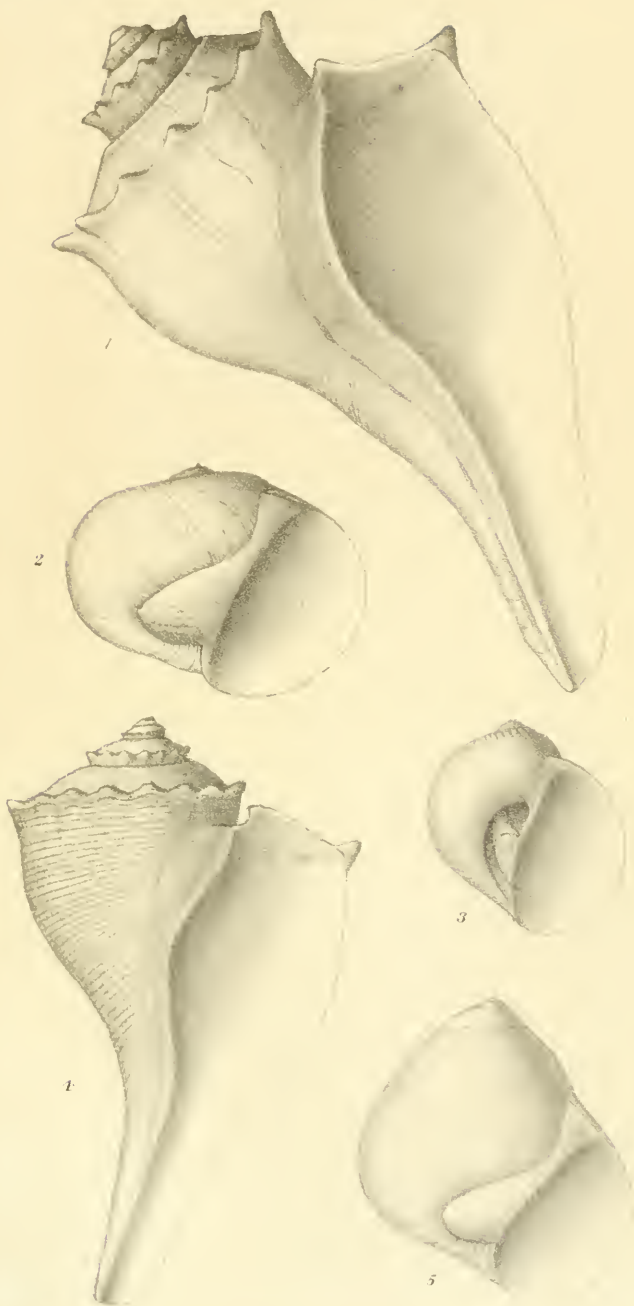


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5





DESCRIPTIONS OF SIXTY-FIVE NEW SPECIES OF MARINE GASTEROPODÆ, INHABITING POLYNESIA.

BY W. HARPER PEASE.

CYLINDRA FORMOSA, Pease. Plate 23, fig. 1.

Description.—T. cylindracco-oblonga, olivæformi, lævigata, polita, transversim regulariter punctato-striata; spira brevi, acuta; columella quadriplicata; pallide rosacea, longitudinaliter alba strigata aut maculata, apertura lutea.

Dimensions.—Long. 14, diam. 6 mill.

Locality.—Ascension.

Shell cylindrically oblong, olive-shaped, smooth, polished transversely regularly striated, striae punctured, rather distant; columella four plaited; light flesh color, spotted or striped longitudinally with white, aperture yellowish.

Allied to *M. filum*, Wood.

MITRA SECTILIS, Pease.

Description.—T. fusiformi, transversim lirata, liris parvis, planulatis, angustis, striis longitudinalibus rugulosis, interstitiis punctatis, basi truncata; spira acuta, acuminata; columella quadriplicata, alba, maculis quadratis luteis picta.

Dimensions.—Long. 24, diam. 8 mill.

Locality.—Insl. Hawaii.

Shell fusiform, transversely ridged, ridges flat, close-set and small, somewhat roughened by longitudinal striae, interstices punctured; base truncate; spire sharply acuminate; columella four-plaited; white, checkered with square yellow spots.

The above may be immature. The spots were originally of a brownish color possibly. I believe it to be extinct, at least on the Sandwich Islands.

MITRA GLABRA, Pease. Plate 23, fig. 2.

Description.—T. oblongo-ovata, crassa, lævigata, polita, longitudinaliter costata, costis rotundis, ad anfr. ultimo obsoletis; columella quadriplicata; cinereo-fusca, anfr. ultimo inferne, castaneo-fusca, fascia unica, angusta, lutea, cingulata.

Dimensions.—Long. 15, diam. 7 mill.

Locality.—Insl. Ascension.

Shell oblong-ovate, solid, smooth, shining, longitudinally ribbed, ribs rounded, becoming obsolete on back of the last whorl; columella four-plaited; color greenish brown, lower half of last whorl chestnut brown; encircled by a single, narrow, yellowish band.

NASSA APPROXIMATA, Pease. Plate 23, fig. 3.

Description.—T. fusiformi-ovata, longitudinaliter costata, costis vix flexuosis, interstitiis transversim striatis, spira acuta; anfr. plano-convexis; labro varicoso, antice muricato-denticulato, intus brevi lirata; columella calloso-laminata, juxta marginem tuberculata, superne unilaminata; apertura oblongo-ovalis, superne vix emarginata. Rufo fusciscenti, linea unica fulvescente cingulata.

Dimensions.—Long. 27, diam. 14 mill.

Shell fusiform ovate, longitudinally ribbed, ribs slightly flexuous, interstices impressly striated transversely, spire acute; whorls flatly convex; lip varicose, prickly denticled before, shortly ridged within; columella callously laminated, closely and evenly tuberculated near its margin, above a single short lamina; aperture oblong oval, slightly emarginate above. Color dark chocolate or reddish brown, a single yellowish line on the middle of the whorls.

The above species has been heretofore confounded with *N. tænia*, Gm.

It was first collected in the Pacific, by Quoy and Gaimard, who described the animal. A good figure of it may also be found in Voy. au Pol Sud, from specimens collected at the Samoa and Solomon Islands.

Having had opportunity of examining a large number of specimens, I hold it to be quite distinct from the West Indian species. It is strongly ribbed throughout and transversely striated. The granules bordering the sutures, mentioned in Voy. au Pol Sud, are formed by the marginal striæ, and are very indistinct on most of the individuals.

NASSA GRACILIS, Pease. Plate 23, fig. 4.

Description.—T. crassa, ovata, acuminata, longitudinaliter plicato-costata, interstitiis concavis, transversim sulcatis, ad suturas marginata; spira gracilis, acuta; apertura parva; columella cum callo luteo tecto, valde dentata; labro valde inerassato, fauce valde lirata; castaneo-fusca.

Dimensions.—Long. 15, diam. 8 mill.

Locality.—Insl. Ascension.

Shell solid, acuminate ovate, longitudinally finely plicately ribbed, interstices concave and distantly grooved transversely, margined at the sutures; spire slender, acute; aperture small; columella covered with a yellowish callosity, extending on to the penultimate whorl, strongly dentate on its edge and furnished with a laminate callosity above; lip much thickened and strongly ridged within its whole length; color dark chestnut brown.

May be compared with varieties of *N. thesites*, Brug.

ENGINA FUSIFORMIS, Pease. Proc. Zool. Soc., London, 1865.
Plate 23, fig. 5.

Description.—T. fusiformi, utrinque attenuata, medio angulata, longitudinaliter nodoso-costata, transversim sulcata et striata; basi contracta; spira acuminata, acuta; anfr. superne parum concavis; columella superne vix excavata et plicata; apertura dimidium longitudinis testæ æquanti, purpureo-rufescente; nigra, luteo irregulariter maculata et fasciata.

Dimensions.—Long. .6, diam. .34 poll.

Locality.—Insl. Howland.

Shell fusiform, attenuated at both ends, angulated at the middle, longitudinally nodosely ribbed, ribs 11–12, rounded, most prominent on the angulation, almost obsolete on the upper part of the whorls, beneath the suture, at which part the whorls are somewhat concavely depressed; spire acuminate, apex acute; contracted at base and slightly recurved; grooved and striate transversely, the striæ fine, regular, covering all parts of the shell; columella excavated above and furnished with one or more laminae; aperture narrow, purplish red, about one-half the length of the shell; color black, spotted and banded with light straw color, occasionally the above colors are reversed; the black color is mostly confined to the longitudinal ribs or nodules.

In sculpture this species resembles *E. lauta*, Rve, and somewhat *E. forticostata*, Rve, both of which species inhabit Polynesia.

ENGINA OVATA, Pease. Proc. Zool. Soc., London, 1865. Plate 23, fig. 6.

Description.—T. abbreviato-ovata, utrinque acuta, medio subangulata, longitudinaliter costata, costis 10-12, rotundatis, transversim irregulariter nodoso-lirata et striata; apertura superne regulariter arcuata, infra contracta; basi vix recurva; nigra liratum interstitiis albis vel pallide luteo-fuscis, denticulis aperturæ albis.

Dimensions.—Long. .5, diam. .32 poll.

Locality.—Insl. Howland.

Shell abbreviately ovata, short, stout, acute at both ends and somewhat angulate at the middle, longitudinally ribbed, ribs 10-12, rounded, encircled transversely with nodose ribs of irregular size and fine striæ; aperture regularly arched above and contracted below; canal short and slightly recurved; black interstices between transverse ribs, whitish, or pale yellowish brown, denticulations of the aperture white.

A short, stout, obese shell, differing in shape from any described species.

ENGINA TUBERCULOSA, Pease. Proc. Zool. Soc., London, 1862.

Description.—T. fusiformi, utrinque attenuata, transversim sulcata, longitudinaliter tuberculato-costata, transversim minutissime striata; columella postice corrugata; denticulis parvis; apertura albida, longitudinis testæ dimidium haud æquans; nigra, anfr. ultimo albo-fasciata.

Dimensions.—Long. 9, diam. 4 mill.

Locality.—Insl. Baker.

Shell fusiform, attenuated at both ends, spire somewhat acuminate, acute, longitudinally tuberculately ribbed, transversely grooved and very minutely striate, longitudinal ribs 12-15, rounded and not prominent; aperture less than one half the length of the shell; columella corrugate and plicate posteriorly; denticulations small; color black, last whorl encircled with a white band, aperture and apex whitish, the lower part of the last whorl and spire are occasionally spotted with white.

ENGINA NODICOSTATA, Pease. Plate 23, fig. 8.

Description.—T. fusiformi-ovate, utrinque attenuata, longitudinaliter, obsolete nodoso-costata, costis 10-12, transversim nodoso-costata, costis tribus, striis minutissimis granuloso-decussata; collumella lævis; labro intus tridentato; apertura

dimidium longitudinis testæ æquante; alba, costis transversalis nigra, apertura alba.

Dimensions.—Long. $6\frac{1}{2}$, diam. 3 mill.

Locality.—Paumotus.

Shell fusiformly ovate, attenuated at both ends, longitudinally obsoletely nodosely ribbed, ribs 10–12, encircled transversely with three nodose ribs, whole surface very minutely granulosely decussated by striæ; columella smooth, outer lip tridentate within; aperture about one-half the length of the shell; white transverse ribs black, aperture white.

This species may be compared with *E. zonata*, Rve. Most of the specimens we have seen are much worn, in which state the color of the transverse ribs is reddish and no trace of the decussating striæ remains.

ENGINA VARIABILIS, Pease. Plate 23, fig. 9.

Description.—T fusiformi, utrinque attenuata, longitudinaliter sulcata, costis duabus nodosis cingulata, interstitiis sulcatis, undique transversim striata; spira acuta; apertura dimidium longitudinis testæ æquante, angusta, recta; nigra, nodis albis, inter costis luteo maculata, apertura violacea.

Dimensions.—Long 9, diam. 5 mill.

Locality.—Paumotus.

Shell fusiform, attenuated at both ends, longitudinally grooved, encircled by two nodose ribs, of which the upper is much the most prominent, interstices grooved, the whole surface transversely striate; spire sharp; aperture one-half the length of the shell, narrow, straight; color black, nodules white, between the ribs spotted with yellow, aperture purplish.

ENGINA STRIATA, Pease. Plate 23, fig. 10.

Description.—T. fusiformi-ovata, utrinque acuta, in medio subangulata, longitudinaliter obsolete costata, transversim costis duabus nodulis cingulata, utrinque transversim inciso-striata; columella recta; alba, costarum longitudinalium latere sinistro fusco strigatis, apertura pallide violacea.

Dimensions.—Long. 8, diam. 5 mill.

Locality.—Paumotus.

Shell fusiform ovate, sharp at both ends, somewhat angular at the middle, obsoletely ribbed longitudinally, transversely encircled by two prominent nodose ribs, somewhat compressed, the

whole surface deeply and regularly striate transversely, forming close set ribs; columella straight; white, left side of the longitudinal ribs striped interruptedly with dark brown, aperture light purple.

I found a single specimen of the above associated with *E. variabilis*; although not apparently mature, I venture to describe it, being so distinct in its shape and sculpture.

ENGINA PARVA, Pease. Plate 23, fig. 11.

Description.—T. fusiformi-ovata, utrinque attenuata, transversim nodoso-costata, costis 5, longitudinaliter sulcata, nodis superioribus spinosis; undique scabriuscula aut corrugata; labro valde quadridentato; columella infra tuberculata; alba, nodulorum seriebus alternatim albis et rufescente-fuscis.

Dimensions.—Long. 6, diam. $3\frac{1}{2}$ mill.

Locality.—Paumotus.

Shell fusiformly ovate, attenuated at both ends, transversely nodosely ribbed, ribs about five in number, longitudinally grooved, grooves distant and shallow; nodules or upper part of last whorl produced into spines, whole surface scabrous or wrinkled; denticles on outer lip large, four in number, columella with two or three small tubercles at base; white, rows of nodules alternately white and reddish brown or black.

The few specimens received of this species are imperfect. I describe it for reason of its striking peculiarities, combining the characters of *Engina* and *Ricinula*. In sculpture, general form and aperture it is an *Engina*, while its spines and roughened surface connect it with *Ricinula*.

SISTRUM STRIATUM, Pease. Plate 23, fig. 12.

Description.—T. cylindraceo-ovata, longitudinaliter costata, interdum transversim obsolete tricostata, costis subnodulosis, undique transversim ineiso-striata; apertura angusta, longitudinis dimidium testæ æquante; alba, costis longitudinalibus, fusciscente nigris, apertura violacea.

Dimensions.—Long. 16. diam. 8 mill.

Locality.—Insl. Kingsmill.

Shell cylindrically ovate, longitudinally ribbed, sometimes with three indistinct transverse ribs, ribs smooth, somewhat nodulous, the whole surface engraved with deep striæ; aperture narrow, one half the length of the shell; white, longitudinal ribs brownish black; aperture violet.

After examining over a thousand specimens, in good condition, of *S. morus* and its varieties, and comparing them with the figures and descriptions of *S. asperum*, I am convinced the latter is a variety of the former, contrary to the opinion of Deshayes and Reeve. Mr. Reeve, in his description of *S. asperum*, omits the character "scabriuscula" given to it by Lamarck. His description of *S. morum* is correct, and agrees more strictly with the type than that of Lamarck. From it the variation extends beyond *S. asperum*. The species above described is distinctly ribbed longitudinally and invariably smooth, the whole surface is deeply striate transversely, and the shape is elongate. It may be hereafter connected with *S. morum* by intermediate varieties, in which case, however, it should retain its name and also *S. asperum*, as varieties.

SISTRUM AFFINE. Proc. Zool. Soc., London, 1862. Plate 23, fig. 13.

Description.—T. crassa, solida, ovata, transversim quinque costata, interstitiis liratis, longitudinaliter irregulariter sulcata; anfr. superne vix excavatis; apertura subangusta, oblongo-ovata; nigricans aut intense fusca, columella albida aut chocolato-fusca.

Dimensions.—Long. 20, diam. 12 mill.

Locality.—Insl. Kingsmill.

Shell thick, stout, ovate, transversely ribbed, ribs five, longitudinally irregularly grooved, forming oblong nodules, interstices between the ribs filled by two or three small ribs or ridges, transversely striated, whorls slightly concave around the upper part; aperture rather narrow, oblong ovate; color black or dark brown, edge of lip black, columella whitish or chocolate brown.

Since the original description was published, I have received more perfect and mature specimens. I still retain it, although the young especially approach near *S. atromarginata*, Blain., and *albomarginata*, Desh. It may prove eventually to be a variety of one of those species. Neither, however, are connected with *tuberculatum*, Blain., as supposed by Mr. Reeve. It will require large collections, from all localities, to define with any degree of accuracy the relative value of the several species of the above type.

SISTRUM SQUAMOSUM, Pease. Plate 23, fig. 14.

Description.—T. crassa, abbreviato-ovata, longitudinaliter et transversim nodoso-costata, costis transversis 4; lira angusta

squamosa interveniente; costis longitudinalibus 7; spira brevi, acuta; apertura oblongo-ovata; costis transversim alternatim albis et fuscis; apertura chocolato-fusca.

Dimensions.—Long. 12, diam. 9 mill.

Locality.—Kingsmill.

Shell thick, solid, abbreviately ovate, longitudinally transversely stoutly nodosely ribbed, transverse ribs four in number, a narrow squamose rib running between them, longitudinal ribs about seven in number; spire short, acute; aperture oblong-ovate; transverse ribs alternately white and dark brown; aperture chocolate brown.

Another species of the same type as the preceding. The whole surface on young specimens is covered with fine scales. There are traces of transverse striæ on the nodules.

SISTRUM TRIANGULATUM, Pease. Plate 23, fig. 15.

Description.—*T. triangularis-ovata*, longitudinaliter costata, costis 6–8, costis parvis decussata, interstitiis excavatis; anfr. superne angulatis, basi contracta, attenuata, undique squamosa; apertura ovata; columella levis; pallide cinerea, costis transversis luteis, apertura violacea.

Dimensions.—Long. 22, diam. 15 mill.

Locality.—Insl. Hawaii.

Shell triangularly ovate, longitudinally ribbed, ribs 6–8, decussated by transverse ribs, interstices excavated, whorls angulated above, at the base contracted, attenuated and slightly recurved, whole surface covered with scales; aperture ovate; columella smooth; denticles on lip seven, extending its whole length; color light ashy gray, transverse ribs saffron yellow, aperture violet.

The above species is Muriciform in shape. In sculpture and somewhat in shape resembles *M. fenestratus*, Chem. The color is seldom preserved, even in live and perfect specimens.

LATIRUS SQUAMOSUS, Pease. Proc. Zool. Soc., London, 1862.
Plate 23, fig. 16.

Description.—*T. fusiformi*, turrita, transversim lirata, sulcis longitudinalibus distantibus nodulosus, nodis compressis, oblongis, interstitiis squamatis, transversim minute liris, longitudinaliter subtilissimi striatis; anfr. ultimo subventricosus, infra contracto; spira turrita, acuta; anfr. ad suturas spinis squamiformibus, prominentibus, erectis, ordinatim ornata; fuscescence-rufa, liris

super costas lutescente, squamis basique lutescente alba, apertura alba.

Dimensions.—Long. 45, diam. 20 mill.

Locality.—Insl. Baker's.

Shell fusiform, transversely ridged, noded by distant longitudinal grooves, nodules compressed, oblong, interstices squamate, finely ridged transversely and minutely striate longitudinally, grooves becoming obsolete on base; last whorl somewhat ventricose, suddenly contracted at base; spire turritid, acute; whorls ornamented at the suture with a row of prominent, erect, squamate spines.

Color brownish red, nodulous portion of transverse ribs yellowish, spines and base, between the transverse ridges, yellowish white, aperture white.

A highly ornamented species, quite distinct from any described.

LATIRUS GIBBUS, Pease. Plate 23, fig. 17.

Description.—T. fusiformi, crassa, lævi, spira acuminata, gracili, acuta; longitudinaliter nodoso-costata, costis 5, magnis, obliquis, compressis, valde elevatis; transversim obsolete costata, costis tribus, rotundatis, irregularibus; labro tenui, simplici; costis albidis, interstitiis purpureo-violaceis, interdum iridescentibus, apertura, violacea.

Dimensions.—Long. 13, diam. 8 mill.

Locality.—Insl. Howland.

Shell fusiform, thick, solid, smooth; spire acuminate, slender, acute; longitudinally nodosely ribbed, ribs five, large, oblique, compressed and much elevated; transversely obsoletely ribbed, ribs three, round and irregular; lip thin, simple; ribs white, interstices pale purple-violet, sometimes iridescent, aperture deep violet.

An aberrant form, quite distinct.

LATIRUS GRANULOSUS, Pease. Plate 23, fig. 18.

Description.—T. elongato-fusiformi, longitudinaliter costata, costis 9, rotundatis, transversim lirata, interstitiis lira parva granulosa cingulata; anfr. superne angulatis, vix excavatis, angulis granuloso-lirata; labro intus lirata; anfr. convexo-rotundatis; rufescente-fusca, granulis pallidis, apertura violacea.

Dimensions.—Long. 22, diam. 12 mill.

Locality.—Paumotu.

Shell elongately fusiform, longitudinally ribbed, ribs nine, rounded, corded with transverse ridges, with a small granose ridge encircling the interstices; whorls angulated and slightly excavated at the upper part, angulation encircled by close set granulose ridges; outer lip lirate within; whorls convexly rounded; color reddish brown, granules lighter, aperture violet.

MARGINELLA POLITA, Pease. Plate 23, fig. 19.

(*M. cylindracea*, Pease, Proc. Zool. Soc. London, 1862.)

Description.—*T. cylindrica*, lævigata, polita, alba, fasciis tribus luteis ornata, et ad basim macula lutea; labro subincrassato, albo medio vix incurvato et contracto; spira brevissima; apertura linearis, inferne latiuscula; columella infra vix curvata; quadriplicata.

Dimensions.—Long. 11, diam. $4\frac{1}{2}$ mill.

Locality.—Insl. Tarawa.

Shell cylindrical, smooth, polished, white, ornamented with three broad yellowish bands, and a spot of same color at base; outer lip slightly thickened externally and white; somewhat involute and slightly contracted in the middle; spire very short; aperture linear, slightly expanded at base; columella very slightly curved below, and four-plaited.

MARGINELLA PACIFICA, Pease. Plate 23, fig. 20.

Description.—*T. oblongo-ovata*, polita, alba, lineis luteis sagittatis transversis ornata; spira brevissima; labro extus, vix incrassato, medio subinflexo, intus lirato; apertura vix curvata; columella quadriplicata.

Dimensions.—Long. 5, diam. 3 mill.

Locality.—Paumotus.

Shell oblong ovate, smooth, polished, white, ornamented with transverse rows of fine yellowish arrow-headed lines; spire very small, not exserted; lip slightly thickened externally and inflexed at the middle, lirate within; aperture slightly curved; columella four-plaited at base.

Quite distinct from *M. sagittata*, Hds. The arrow-headed lines are turned to the left.

MARGINELLA PYRIFORMIS, Pease. Plate 23, fig. 21.

Description.—*T. oblongo-pyriformi*, lævigata, nitida; spira brevis; labro extus incrassato, intus denticulato; apertura angusta linearis; alba, fasciis tribus luteis ornata, ad suturam, medio et ad basim.

Dimensions.—Long. 6, diam. 3 mill.

Locality.—Paumotus.

Shell oblong pyriform, smooth, shining, white, with three yellowish bands at the suture, in the middle and at the base; spire short; outer lip thickened externally, denticulate within its whole length; aperture narrow linear.

MARGINELLA PAUMOTENSIS, Pease. Plate 23, fig. 22.

Description.—T. oblonga, subcylindrica, polita, lævigata, alba, luteis trifasciata; spira brevissima; labro medio inflexo, intus lævigato; columella ad basim laminato callosa, triplicata.

Dimensions.—Long. 5, diam. $2\frac{1}{4}$ mill.

Locality.—Paumotus.

Shell oblong, somewhat cylindrical, polished, smooth, white, with three faint yellowish bands; spire very short; lip inflexed at the middle, smooth within; columella laminately callous at base, three-plaited.

The above may possibly belong to genus *Volutella*. It has somewhat the appearance of *M. polita*, Pease. The columella folds will serve to distinguish it. It is also much smaller and more slender.

VOLUTELLA ELONGATA, Pease. Plate 23, fig. 23.

Description.—T. elongata, subcylindrica, lævigata, alba, lutea pallide fasciata; spira brevissima; labro subincrassato, involuto; apertura angusta, linearis, infra subdilata; columella quadriplicata, ad basim laminato-callosa.

Dimensions.—Long. $9\frac{1}{2}$, diam. $3\frac{1}{2}$ mill.

Locality.—Insl. Fanning.

Shell elongate, somewhat cylindrical, smooth, white, faintly banded with yellowish; spire very short, outer lip slightly thickened externally, involute; aperture narrow, linear, slightly expanded at base; columella four-plaited, laminately callous at base.

OLIVELLA (CALLIANAX) SIMPLEX, Pease. Plate 23, fig. 24.

Description.—T. subfusiformi, ad basim truncata, lævigata, alba; anfr. 4 ad suturam marginatis subangulatis, spira vix producta; labro lævigato; apertura lata; columella callosa, vix curvata.

Dimensions.—Long. $4\frac{1}{2}$, diam. 2 mill.

Locality.—Paumotus.

Shell somewhat fusiform, truncate at base, smooth, white; whorls four, margined and slightly angulate at sutures; spire somewhat produced; outer lip simple, smooth within; aperture wide; columella slightly curved and callous.

The generic characters of the above are doubtful. It may prove the type of a new genus. If correct, it is the first species of *Olivella* described from Polynesia.

NARICA DELICATA, Pease. Plate 23, fig. 25.

Description.—T. ventricosoglobosa, tenui, fragilis, alba, apice roseo; transversim costis ligata, costis parvis, confertis, prominentis, subflexuosis, interstitiis longitudinaliter striatis; apice acuto, vix elevato; labro tenui; umbilico magno, profundo, striis cancellato.

Dimensions.—Diam. 9, long. 8 mill.

Locality.—Paumotus.

Shell globose, ventricose, thin, fragile, white, apex rose-colored; corded transversely by fine, close-set, somewhat wrinkled prominent ribs, interstices barred by longitudinal raised striæ; apex acute, rather elevated; lip thin; umbilicus open, deep, extending to the apex, finely cancellated by striæ.

The above differs from *Cuvieriana*, Recl., principally in its sculpture.

NERITOPSIS INTERLIRATA, Pease. Plate 23, fig. 26.

Description.—T. vix oblique-ovata, ad suturas depressa, solida, alba; spiraliter nodoso-costata, lira minore intercurrente, interstitiis, striis elevatis, tenui clathratis; apertura subcircularis.

Dimensions.—Diam. 13, long. 10 mill.

Locality.—Insl. Annaa.

Shell somewhat obliquely ovate, depressed at the sutures, solid, white, spirally granosely ribbed, with an intermediate smaller rib, interstices barred by fine, close raised striæ; aperture nearly circular.

I have hesitated to separate the above species from *N. radula* for reason of the great variation that many marine species of *Gasteropoda* undergo at the Paumotus.

There is also a remarkable resemblance between the fossil species of this genus and the *radula* in sculpture.

My collection comprises specimens of the latter from four localities in Polynesia, which surely differ from the above. There appears to be a regular gradation from the fossil species, through

the *radula*, to the above, in the prominence of the granules and the depth and size of the longitudinal striæ.

EUCHELUS ANGULATUS, Pease. Plate 23, fig. 27.

Description.—T. turbinato-globosa, solida, alba, imperforata; anfr. ultimo in medio biangulato, angulis costis acuto-granulosis marginatis, supra uniangulato, infra biangulato, interstitiis profunde foveolatis, ad suturam, concaviter depresso; labro denticulato.

Dimensions.—Diam. 5, alt 4 mill.

Locality.—Insl. Annaa.

Shell globose, somewhat turbinated, solid, white, last whorl biangulate on the middle, angulation bordered by stout, prickly granulose ribs, encircled by one rib above the angulation and two below, interstices deeply pitted, concavely depressed beneath the sutures; imperforate, (the young narrowly perforate); denticulations on outer lip small.

Operculum horny, many-whorled, nucleus central.

Closely allied to *E. foveolatus*, A. Ad., specimens of which I have from Tahiti. The above may be recognized by the strong angulations at the middle of last whorl, and less number of ribs. The operculum differs from the figure given in "Adams' Genera."

GENA LÆVIS, Pease. Plate 23, figs. 7, 28, 29.

Description.—T. oblonga, supra plano-depressa, infra rotundata, lævi, solida, transversim striis incrementis signata; labro recto, labrum incrassatum; apertura oblongo-ovalis; spira postica, vix prominula; viridescens olivacea, albida, fusca et rubra varie maculata aut marmorata, interdum omnino viridula.

Dimensions.—Long. 11, diam. $6\frac{1}{2}$ mill.

Locality.—Tahiti.

Shell oblong, flatly depressed on its upper side, rounded on its lower edge, smooth, solid, marked transversely with striæ of growth; outer lip straight, inner lip thickened on its edge; aperture oblong oval; spire posterior, small, slightly elevated; greenish olive, variously spotted or mottled with white, brown or red, sometimes wholly of a dark green color.

The figures and descriptions of the animals of two species of this genus have been published—*G. planulata*, Lam., and *nigra*, Quoy.

The animal of the above species was drawn from life by Mr.

Garrett, and may be relied on as correct. He had opportunity of observing a number of individuals in their natural habitat, and examining them confined. The animal lives in the upper region of the laminarian zone, on branched coral, but usually found under loose stones, on mud and sandy bottom, at low water mark. The color of the above is similar to that of its shell, of an olivaceous or brownish olive, reticulately veined with dusky, locomotive disk and tentacular appendages pale. The first is large, and cannot be wholly retracted beneath the shell, it is oblong, rounded behind, thick and fleshy, ciliated around the margin, and slightly tuberculated on the posterior upper portion.

When expanded, three hirsute cylindrical tapering cirrhi project from each side of the shell, which are attached to the upper surface of the foot, and at the outer base of each is a minute arborescent appendage.

The mantle is margined, with a single series of pinnate cirrhi, which, when the animal is in motion, are recumbent on the margin of the shell. Head proboscidiform, well developed, lips wrinkled, mouth elliptical.

Tentacles very long, slender, tapering and hirsute. Two arborescent appendages in front of the tentacles. Eyes on hirsute pedicels, at the hinder base of the tentacles. A siphon projects on each side of the neck, the left incurrent and the right excurrent.

GENA ROSACEA, Pease. Plate 24, fig. 1.

Description.—T. oblongo-ovali, convexa, supra prope apicem subdepressa, tenuiscula, concentrice striata, striis elevatis, distantibus, transversim minutissime striata; labro recto; spira postica; anfr. angulatis, vix elevatis; rubro alboque varie picta; striis concentricis rubris, spira albida aut flavidula.

Dimensions.—Long. $6\frac{1}{2}$, diam. 4 mill.

Locality.—Paumotus.

Shell oblong oval, convex, somewhat depressed, on upper side near the apex rather thin, concentrically distantly and elevately striate, transversely very minutely striate; outer lip straight; spire posterior, whorls angulated, slightly elevated; variously mottled with pink and white; concentric striæ red, spire yellowish or white.

CAPULUS LIBERATUS, Pease. Plate 24, fig. 2.

Description.—T. pileiformi, elevata, crassa, alba, transversim tenuiter costata, longitudinaliter striata; spira oblique convoluta, disjuncta.

Dimensions.—Long. 9, diam. 7 mill.

Locality.—Paumotus.

Shell cap-shaped, much elevated, thick, white, transversely finely ribbed, longitudinally striate; spire obliquely convolute, free, detached.

NERITINA DISPAR, Pease. Plate 24, fig. 3.

Description.—T. globosa, solida, lævigata, nitida; anfr. superne concavis, longitudinaliter, tenuiter et irregulariter striata; area columellari plana, callosa; spira vix exserta; nigra, punctis albis angulatis maculata, interdum in seriebus ordinatis, aut rubris fasciata; aut lineis nigris longitudinalibus, flexuosis notata; columella aperturaque luteo-olivacea.

Locality.—Insl. Roratonga.

Shell globose, solid, smooth, shining, whorls concave around the upper part, very finely and irregularly striate longitudinally; columella area flat and callous; spire rather exserted; black, freckled with small angular white dots, sometimes disposed in bands, seldom banded with pink, sometimes marked with fine longitudinal wrinkled black lines; columella and aperture yellowish-olive.

This species is allied to *Oualanensis* and *lentiginosa*. It is smaller than either. From the first it may be distinguished by the spire being exserted and concave beneath, and painted with a smaller pattern. It differs from the last principally in shape, and also color of the aperture.

NERITINA RUDIS, Pease. Plate 24, fig. 4.

Description.—T. ovata, crassa, solida, spiraliter confertim striata; spira depressa; area columellari lævigata, plana, vix concava, medio denticulata; labro intus polita; nigra, alboque fasciata aut maculata, apertura lutescente.

Dimensions.—Diam. 12, alt. 9 mill.

Locality.—Ponape.

Shell ovate, thick, solid; spire depressed, spirally rather closely striate; columella area smooth, flat, slightly concave, denticulate on the middle; outer lip smooth, polished within; banded or spotted with black and white, aperture pale yellow.

The above agrees in size and shape with *N. pica* (Gld., non Chenu).

NERITINA RUBIDA, Pease. Plate 24, fig. 5.

Description.—T. ovata, rotundato-convexa, tenuiscula, striis incrementis rugulosa; spira depressa; area columellari, cinerea,

laevigata, plana, latissima; colore rufescente-succinea, interdum nigro strigata, aut omnino-nigra.

Dimensions.—Diam. 5, alt. 3 mill.

Locality.—Tahiti.

Shell ovate, roundly convex, rather thin, roughened by lines of growth; spire depressed; columella area of an ash color, smooth, plane, very wide; reddish-amber color, sometimes streaked with black or wholly black.

Closely allied to *N. succinea*, inhabiting the West Indies. It is shorter and more convex than that species, and the columella area broader.

NERITA MACULATA, Pease. Plate 24, fig. 6.

Description.—T. globosa, rotundata, solida, crassa, spiraliter tenuiter et creberrime, lineari sulcata; spira plano-depressa; area columellari vix concava, granulata et corrugata, fortiter dentata; labro intus valde crenato et dentato; nigra, punctis luteis lentiginosa.

Locality.—Tahiti.

Shell globose, rounded, solid, thick, spirally finely linearly grooved throughout; spire flatly depressed; columella area slightly concave, granulated and wrinkled, strongly toothed, teeth three, of which the upper is very broad; lip strongly crenated and toothed; black, speckled with yellowish dots.

It is surprising this species should not have been noticed before. It approaches *N. argus*, Recl., but is more round and compact, also regularly grooved throughout.

TROCHUS EXILIS, Pease. Plate 24, fig. 7.

Description.—T. imperforata, elato-conica; anfr. plano-concavis, ad marginem granoso-costatis, utrinque tenuiter transversim striata; basi convexa, lirata et striata; apertura ad basim vix effusa; alba, castanea transversim lineata et longitudinaliter strigata, basi castaneo-punctata.

Dimensions.—Alt. $7\frac{1}{2}$, diam. 5 mill.

Locality.—Paumotu.

Shell imperforate, elevately conical; whorls flatly concave, encircled at their lower margin with a granose rib, transversely minutely striate throughout; base convex, ridged and striated; aperture slightly effuse at base of columella; white, finely lined transversely and striped longitudinally with chestnut-brown, base dotted with brown.

Of the same character as *T. fastigiatus*, Ad., and *Cumingii*, Ad.

TROCHUS CONOIDALIS, Pease. Plate 24, fig. 8.

Description.—*T. acuto-conica*, anguste perforata; anfr. plano-declivibus, transversim sulcatis, longitudinaliter plicato-corrugatis, inferne ad marginem plicato-squamatis; basi plano-convexa, tenuiter sulcata; albida, luteo aut purpureo tincta.

Dimensions.—Alt. 5, diam. 4 mill.

Locality.—Paumotu.

Shell sharply conical, narrowly perforate; whorls flatly sloping, transversely grooved, plicately wrinkled longitudinally and plicately scaled at the margin; base flatly convex, finely grooved; whitish, stained with saffron-yellow or purple.

TROCHUS MARMOREUS, Pease. Plate 24, fig. 9.

Description.—*T. acuto-conica*, solida, crassa, anguste perforata, transversim regulariter sulcata; anfr. planulatis aut subconvexis; anfr. ultimo ad basim angulato; basi convexa, circulariter sulcata et striata; labro intus lirato; columella truncata; rubro alboque marmorata.

Dimensions.—Alt. 8, diam. 5 mill.

Locality.—Paumotu.

Shell sharply conical, solid, thick, narrowly perforate, transversely regularly grooved throughout; whorls plane or slightly convex; last whorl angulate at base; base convex, circularly grooved and finely striate; lip lirate within; columella truncate at base; marbled with white and rose color.

Of very doubtful generic characters.

OPERCULATUM AURANTIUM, Pease.

Description.—*T. ovata*, solida, depresso-convexa, latere dextro rotundato-convexo, latere sinistro plano-convexo, supra concentricè tenui striata, radiatim obsolete et late costata, subtus costis parvis radiatim rugulosa; supra alba, epidermide membranacea induta, subtus medio castaneo-fusca, impressione musculari fulvescente fascia castanea concentricè marginata, extus fulvescente.

Dimensions.—Long. $5\frac{1}{2}$, diam. 4 inches.

Locality.—Hawaii.

Shell ovate, solid, depressly convex, right side roundly convex, left side flatly convex, upper side concentrically finely

striate, and also marked by lines of growth, radiately, obsoletely, broadly and distantly ribbed, interior roughened by small radiating ribs; upper side white, covered with a thin membranaceous epidermis, beneath in the centre dark chestnut-brown, muscular impression yellowish, bordered by a concentric band of chestnut-brown, outer edge yellowish.

Dr. Gould, in "Report Am. Expl'g. Exp.," proposed to adopt the name of *O. umbellatum*, Gm., for the above species. Gmelin's description, however, does not apply, and was undoubtedly drawn up from a specimen of *O. Indicum*. No specimens of shells had reached Europe from the Hawaiian Islands in his day. This species is distinct both as to shell and animal. The latter when living is of an orange-yellow, the whole surface covered with tubercles, a character not mentioned in any description of *O. Indicum*. The shell on its upper side is finely striate concentrically, not radiately as *O. Indicum*, as well as more prominently marked by lines of growth. The radiating ribs are scarcely perceptible. The right side is much more elevated than the opposite, probably to accommodate the branchiæ. The color of the interior differs from both *O. Indicum* and *O. Cumingii*, Desh., of which I have specimens. The latter is more nearly connected with the Mediterranean form.

The animal of the above attains the size of eight inches in length, of which the shell covers five and a half.

SCALARIA PERPLEXA, Pease.

Description.—T. pyramidali-elongata, solida, imperforata, nitida, alba, fascia fusca ad suturas; anfr. 9–11 rotundatis, lævibus; anfr. ultimo costa spiralis ad inferiorem partem; sutura profunde impressa; varicibus 9–10, prominentis, irregularis, compressis; apertura abbreviato-ovalis.

Dimensions.—Long. 32, diam. 13 mill.

Locality.—Hawaii.

Shell pyramidally elongate, solid, imperforate, shining, ivory white, dark brown at the sutures; whorls 9–11, rounded, smooth, rather rapidly enlarging, the last with a spiral rib encircling the axis; suture deeply impressed; varices 9–10, prominent, compressed, irregular in size, more or less continuous; aperture abbreviately oval.

We attach the above name to this species for reason of its having been so long confounded with *S. clathrus*. The whorls are more rounded, and it differs in color from that species. Very rarely the whole space between the varices is colored dark purplish-brown.

SCALARIA DECUSSATA, Pease. Plate 24, fig. 10.

Description.—T. elongata, gracilis, crassiuscula, imperforata, alba; anfr. 7, rotundatis, anguste separatis; varicibus 7, continuis, laminatis, crassis, interstitiis striis minutissimis decussatis; apertura subrotundata.

Dimensions.—Long. 9, diam. 4 mill.

Locality.—Hawaii.

Shell elongate, slender, rather thick, imperforate, white; whorls six, rounded, narrowly separate; varices seven, stout, regular, continuous, laminate, interstices decussated by very minute raised striæ; aperture nearly round.

SCALARIA PAUMOTENSIS, Pease. Plate 24, fig. 11.

Description.—T. pyramidalis, acuminata, crassa, imperforata, lævi, alba; anfr. 6, rotundatis, anguste separatis; varicibus 7, crassis, continuis, recurvis; apertura subcircularis.

Dimensions.—Long. 9, diam. 5 mill.

Locality.—Paumotus.

Shell pyramidal, acuminate, thick, imperforate, smooth, white; whorls six, rounded, narrowly separate; varices seven, stout, regular, continuous, recurved; aperture nearly circular.

The above species was found associated with *S. replicata*, Sow. The latter species is not umbilicate, as was described.

SCALARIA CRISPATA, Pease. Plate 24, fig. 12.

Description.—T. tenui, elongata; anfr. ultimo, subventricosus; alba, imperforata; anfr. 8-9, convexis, contiguus, transversim minute striata; sutura profunda; varicibus numerosis, parvis, tenuis, crenulatis, crispatis, super suturam continuis; apertura, magna, ovalis.

Dimensions.—Long. 20, diam. 10 mill.

Locality.—Paumotus.

Shell light, thin, elongate, imperforate, white; last whorl slightly ventricose; whorls 8-9, convex, contiguous, finely striate transversely; sutures deep; varices numerous, small, thin, beautifully crisped and crenulated, continuous over the sutures; aperture large, oval.

Somewhat allied to *S. dubia*. A variety of the above occurs at the same locality, much smaller, last whorl more ventricose, the varices thicker, and the transverse striæ more distinct, sometimes also very narrowly perforate.

SCALARIA CRENULATA, Pease. Plate 24, fig. 13.

Description.—T. solidiuscula, abbreviato-turrita, lævi, umbilicata, pallide rosacea; anfr. 4, rotundatis, late separatis; varicibus 6, laminatis, crenulatis ad suturam irregulariter junctis, albis; apertura circularis.

Dimensions.—Long. 5, diam. 4 mill.

Locality.—Tahiti.

Shell rather solid, abbreviately turritid, smooth, umbilicate; whorls 4, separated by a wide and deep suture; varices 6, laminate, crenulate, erect, irregularly connected at the suture, white; aperture circular.

This beautiful little species is very rare, I having met with but a single specimen. It may be classed with genus *Cirsotrema*, and is somewhat allied to *C. hyalina*, Sow.

SCALARIA SYMMETRICA, Pease. Plate 24, fig. 14.

Description.—T. elongata, acuminata, imperforata, crassa, alba; anfr. 6, contiguus, convexis, transversim striatis; varicibus 16, crassis, vix recurvis, ad suturam continuis; columella ad basim crassa, vix expansa; apertura subcircularis.

Dimensions.—Long. 8, diam. 3 mill.

Locality.—Tahiti.

Shell elongate, acuminate, imperforate, solid, white; whorls 6, contiguous, convex, striated transversely; varices 16, thick, slightly recurved, continuous over the sutures; columella thickened and somewhat expanded at base; aperture nearly circular.

A solid little shell, of simple characters.

FASTIGIELLA SQUAMULOSA, Pease. Plate 24, fig. 15.

Description.—T. elongato-turrita, subfusiformi, longitudinaliter costata, costis 7, rotundatis, transversim lirata, interstitiis profunde excavatis; undique squamulosa; columella lævigata, recta; labro intus lævigata; canali vix producta et recurva; alba, apice basique rosaceis.

Dimensions.—Long. 28, diam. 11 mill.

Locality.—Paumotus.

Shell elongate, turritid, somewhat fusiform, longitudinally ribbed, ribs 7, rounded, transversely ridged, interstices deeply excavated, whole surface covered with small scales; columella

smooth, straight; outer lip smooth within; canal slightly produced and recurved; white, base and apex rose color.

So far as I am aware, the only species heretofore known is the one on which the genus was founded, *F. carinata*, Rve. The above corresponds to and confirms the generic characters established by Mr. Reeve.

The peculiar sculpture and color of this species separates it distinctly from any other genus of Cerithiidae.

ODOSTOMIA STRIATA, Pease. Plate 24, fig. 16.

Description.—T. elongata, cylindraceo-turrita, subpellucida, transversim conferte et tenui striata; anfr. 7, plano-convexis, ad suturam vix angulata; sutura bene impressa; apertura parva, ovata; alba, spira interdum flavescente aut pallide castanea.

Dimensions.—Long. $5\frac{1}{2}$, diam. $1\frac{1}{2}$ mill.

Locality.—Paumotus.

Shell elongate, cylindrically turritid, subpellucid; whorls seven, planely convex, transversely closely and finely striated, slightly angulate at the suture; suture well impressed; aperture small ovate; columella fold distinct; white, spire sometimes yellowish or light chestnut brown.

ODOSTOMIA POLITA, Pease. Plate 24, fig. 17.

Description.—T. elongata, cylindracea, lævigata, glabra, albida aut flavescente; anfr. 8, planis; sutura subimpressa; apertura parva, oblongo-ovata, plica magna; columella callosa.

Dimensions.—Long. 6, diam. 2 mill.

Locality.—Tahiti.

Shell elongate, cylindrical, smooth, glabrous, whitish or yellowish; whorls eight, plane, suture slightly impressed; aperture small, oblong ovate; columella fold well developed; columella callous.

ODOSTOMIA RUBRA, Pease. Plate 24, fig. 18.

Description.—T. elongata, cylindracea, rosacea, longitudinaliter striata, transversim obsolete striata; anfr. 9-10, planis, ad suturam marginatis; apertura oblongo-ovata; columella vix callosa.

Dimensions.—Long. 10, diam. 2 mill.

Locality.—Paumotus.

Shell elongate, cylindrical, light rose color, longitudinally striate, and indistinctly striate transversely; whorls 9-10,

plane, marginate at the suture; aperture oblong ovate; columella slightly callous.

ODOSTOMIA ROSACEA, Pease. Plate 24, fig. 19.

Description.—T. oblonga, cylindracea, solida, lævigata, nitida; anfr. 5, plano-convexis, obsolete marginatis; apertura elongato-ovata; rosacea, ad basin pallida aut alba, maculis albis aut lineis, infra suturam ornata.

Dimensions.—Long. 7. diam. 2 mill.

Locality.—Paumotus.

Shell oblong, cylindrical, solid, smooth, shining; whorls five, flatly convex, indistinctly marginated; aperture oblong ovate; rose color, pale or white at base, ornamented with a row of longitudinal spots or lines beneath the suture.

ODOSTOMIA GRACILIS, Pease. Plate 24, fig. 20.

Description.—T. gracilis, elongata, tenui, subturrita, transversim tenui striata, alba; anfr. 6, plano-convexis, ad suturam acute angulatis; apertura elongato-ovata.

Dimensions.—Long. 4, diam. $1\frac{1}{4}$ mill.

Locality.—Hawaii.

Shell slender, thin, elongate, somewhat turritid, finely striate transversely; whorls six, flatly convex, acutely angulated at the suture; aperture elongate ovate.

ODOSTOMIA DEBILIS, Pease. Plate 24, fig. 21.

Description.—T. gracilis, elongata, lanceata, solidiuscula, longitudinaliter striata, transversim minutissime striata; anfr. 9, planis, ad suturam acute angulata; apertura oblongo-ovalis; spira rosea, infra albida.

Dimensions.—Long. 9, diam. 2 mill.

Locality.—Insl. Howland.

Shell slender, elongate, lance-shaped, rather thick, longitudinally striate and also transversely very minutely; whorls nine, flat, acutely angulate at the sutures; aperture oblong oval; spire rose color, lower part and base whitish.

The above are the first of the genus described from the Pacific Islands. They are rare, though no doubt numerous in species.

TURBONILLA ELONGATA, Pease. Plate 24, fig. 22.

Description.—*T. elongata*, turrita, gracilis, alba; longitudinaliter regulariter criberrime costata, transversim striata; anfr. 14, convexis, univaricosis; sutura bene impressa; columella infra tortuosa; labro extus late varicoso, intus forte lirato; apertura quadrato-ovalis.

Dimensions.—Long. 19, diam. 4 mill.

Locality.—Paumotus.

Shell elongate, turrited, slender, white, longitudinally regularly and closely ribbed, transversely striate; whorls fourteen, convex, furnished with a simple varix on each whorl; suture well impressed; columella twisted below; lip widely varicose on its outer edge, strongly lyrate within; aperture squarely oval.

The above species approaches *T. grandis*, Ad. and Rve. Its characters are not developed until it attains maturity; such may be the case with *T. grandis*. The lip of large sized specimens is thin and simple, similar to that of most species of this genus. The ridges within are not formed until after the lip is thickened externally by a varix. At the base of columella the aperture is apparently slightly effuse.

In sculpture, general shape and form of aperture, it is a true *Turbonilla*. For reason of its peculiarities I propose to separate it from the *Turbonilla* proper, under the subgeneric name of *Lancea*.

T. grandis probably included.

STYLIFER DEFORMIS, Pease. Plate 24, fig. 23.

Description.—*T. tenui*, lævigata, nitida, pellucida, alba, longitudinaliter obsolete striata; anfr. 6-10, rotundato-convexis, ad suturam anguste marginatis, ultimo ventricosus; spira parva, contracta, distorta, apertura oblongo-ovata, subeffusa; labrum ad basim vix reflexum.

Dimensions.—Long. 12, diam. 4 mill.

Locality.—Paumotus.

Shell light, thin, smooth, shining, pellucid, white, indistinctly striated longitudinally; whorls 6-10, roundly convex, narrowly marginate at the suture, the last swollen; spire usually much contracted, very slender, distorted; aperture oblong ovate, slightly effuse at base; inner lip slightly reflected.

A light, fragile species. The shape of the columella can

be seen its whole length, through the shell. Scarcely two specimens agree in shape. The last whorl is always swollen, and those above, on most specimens, becomes suddenly contracted and run out in needle shape; others are of a cylindrical shape, the whorls retaining their size to the apex.

EULIMA VENUSTA, Pease. Plate 24, fig. 24.

Description.—T. solidiuscula, polita, vitrea, subulata, subinflexa, cinereo-alba; anfr. 9–10, plano-convexis, marginatis; apertura ovata.

Dimensions.—Long. 6, diam. 2 mill.

Locality.—Tahiti.

Shell rather solid, polished, vitreous, elongate, subulate, somewhat curved and distorted, ashy white; whorls 9–10, flatly convex, distinctly marginated; aperture ovate.

Dimensions.—Long 6, diam. 2 mill.

Locality.—Tahiti.

The above occurs, associated with *acicula*, Gld. = *vitrea*, Ad., at Tahiti. The latter are widely distributed, most common and largest in size at Tahiti. The above is closely allied to *acicula*, but more solid and slender, smaller and more curved and distorted.

EULIMA EXILIS, Pease. Plate 24, fig. 25.

Description.—T. solidiuscula, elongata, gracilis, polita, nitida, alba; anfr. planis, obsolete marginatis; columella vix callosa; apertura parva, oblongo-ovata.

Dimensions.—Long. 9, diam. $2\frac{1}{2}$ mill.

Locality.—Paumotus.

Shell rather solid, elongate, slender, shining, polished, white; whorls plane, indistinct, marginated; columella slightly callous; aperture small, oblong-ovate.

EULIMA INFLEXA, Pease. Plate 24, fig. 26.

Description.—T. solida, subulata, inflexa, distorta, nitida, alba; anfr. marginatis, ultimo ventricosus, oblique productus; spira gracilis; apertura parva; columella callosa.

Dimensions.—Long. 10, diam. 4 mill.

Locality.—Paumotus.

Shell solid, subulate, curved, distorted, white, shining; whorls marginated, last whorl swollen, somewhat produced obliquely; spire slender; aperture very small; columella callous.

A distinct species, easily recognized from its curved shape and character of last whorl.

MUCRONALIA GRACILIS, Pease. Plate 24, fig. 27.

Description.—T. solida, polita, nitida, elongata, turrita, alba; anfr. 7, rotundato-convexis; sutura bene impressa; apertura oblique ovata; columella subcallosa.

Dimensions.—Long. 4, diam. 2 mill.

Locality.—Tahiti.

Shell solid, polished, shining, elongate, turrited, white; whorls 7, convexly rounded, suture well impressed; aperture obliquely ovate; columella slightly callous.

The most slender of this genus.

RISSOINA COSTULATA, Pease. Plate 24, fig. 28.

Description.—T. elongata, fusiformi, gracilis, longitudinaliter valde costata, transversim striata; anfr. plano-convexis; sutura bene impressa, sulcata; apertura parva, ovata; alba, anfr. medio fascia castaneo-fusca cingulatis.

Dimensions.—Long. 5, diam. 2 mill.

Locality.—Paumotus.

Shell elongate fusiform, slender, longitudinally prominently ribbed, striate transversely; whorls flatly convex; suture deeply impressed, grooved; aperture very small, ovate; white, encircled by a chestnut brown band on middle of whorls.

RISSOINA SEMPLICATA, Pease. (Proc. Zool. Soc. London, 1862). Plate 24, fig. 29.

Description.—T. subulata polita, nitida, subpellucida, alba; anfr. 6, plano-convexis; spira longitudinaliter-plicata; apertura ovata, subeffusa; columella vix callosa.

Dimensions.—Long. $3\frac{1}{2}$, diam. $1\frac{1}{2}$ mill.

Locality.—Insl. Howland.

Shell subulate, white, shining, polished, subpellucid; whorls 6, flatly convex; spire longitudinally plicate; aperture ovate, slightly effuse; columella slightly callous.

RISSOINA TENUISTRIATA, Pease. Plate 24, fig. 30.

Description.—T. solida, subulata, alba, longitudinaliter creberrime tenuistriata; anfr. 6—7, convexis, ad suturam vix depressis marginatis; anfr. ultimo magno, dimidiam longitudinis

testæ æquante; apertura obliquata, semilunaris, subeffusa; columella callosa.

Dimensions.—Long. 9, diam. 4 mill.

Locality.—Paumotus.

Shell subulate, solid, white, longitudinally, finely, closely and regularly striate; whorls 6—7, convex, somewhat depressed at the suture and marginated; last whorl large, one-half the length of the shell; aperture oblique, of a semilunar shape, slightly effuse; columella callous.

RISSOINA STRIATULA, Pease. Plate 24, fig. 31.

Description.—T. crassa, subulata, alba, transversim tenui et creberrime striata; anfr. convexus, ad suturam vix depressis, anfr. ultimo magno; apertura obliquata, oblongo-ovata; columella vix arcuata, callosa; ad basim subeffusa.

Dimensions.—Long. 9, diam. $3\frac{1}{2}$ mill.

Locality.—Paumotus.

Shell solid, subulate, white, transversely finely and closely striate; whorls convex, slightly depressed at the suture, last whorl large; aperture oblique, oblong-ovate, slightly effuse at base of columella; columella slightly arched and callous.

The two last above-described species, with *R. ambigua*, Gld., form a group resembling each other in shape and form of aperture, which is oblique, large and open.

Ambigua is the smallest, distinctly ribbed, *tenuistriata* is finely striate longitudinally, and *striatula* striate transversely. All the species of this genus, heretofore described by me, from the Hawaiian Islands, also inhabit the Islands of Southern Polynesia.

RISSOA SEMICOSTATA, Pease. Plate 24, fig. 32.

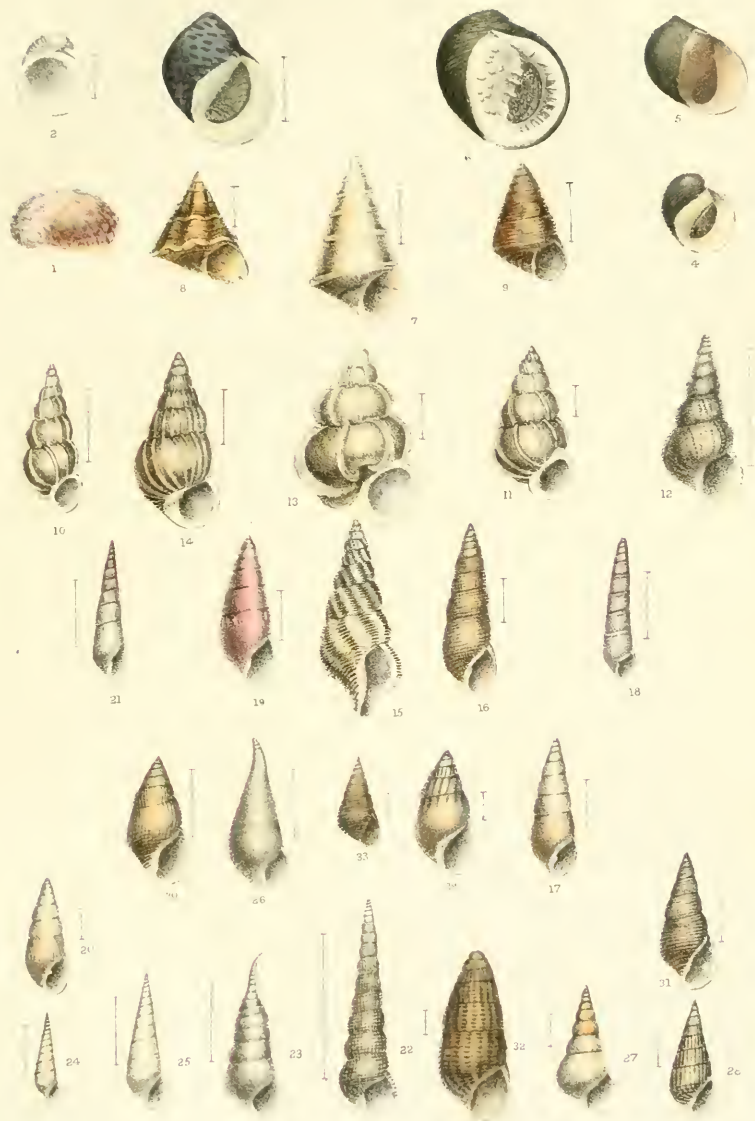
Description.—T. oblongo-ovalis, subcylindracea, solidiuscula, albida, aut pallide flavescens, transversim tenuistriata, longitudinaliter creberrime tenui costata, costis ad anfr. ultimum evanescentibus; anfr. 5—6, convexo rotundatis; sutura valde impressa; apertura parva, ovalis.

Dimensions.—Long. 3, diam. $1\frac{1}{2}$ mill.

Locality.—Insl. Carolinæ.

Shell oblong-oval, somewhat cylindrical, rather solid, whitish or pale yellow, transversely finely striate, longitudinally finely and closely ribbed, ribs obsolete or disappearing on back of last





MONOGRAPH OF THE TERRESTRIAL MOLLUSCA OF THE
UNITED STATES.

BY GEORGE W. TRYON, JR.

[Continued from page 174.]

Family PUPADÆ.

Shell cylindrical, with generally obtuse apex, the whorls numerous and nearly equal; aperture small, rounded, with expanded or reflected lips, and generally armed with teeth or laminae within. Minute in size in most of the North American species.

Animal.—Tentacles very small or wanting; foot short, obtuse or pointed behind.

Remarks.—These shells are the smallest of all the terrestrial mollusca inhabiting the United States (except *P. incana*, which is a large species, but belongs to a West Indian group). They are so minute, indeed, that it requires the strictest scrutiny of the damp ground, moss, or decayed wood inhabited by them, in order to detect their presence, a difficulty which is much increased by their color, which is dull and earthy.

Genera.

1. CIONELLA, Jeffreys. Oblong-acuminate, smooth, polished; aperture small, oval, with a short, arcuate, more or less truncated columella.
2. STENOGYRA, Shuttleworth. Cylindrically turritid, generally truncate at apex, epidermis corneous, shining; aperture small, oval, columella truncate.

3. *MACROCERAMUS*. Turritid or conical, apex attenuated, last whorl angulated around its base; aperture oval, peristome not continuous nor reflected, except over the columella. Generally white with stripes or spots of darker markings.
4. *PUPA*, Draparnaud. Cylindrical, minutely perforate, size very small, aperture small, lip expanded or reflected, generally toothed within. Animal with superior and inferior tentacles.
5. *STROPHIA*, Albers. Shell large, with obtuse apex. the whorls generally covered with transverse ribs. Lip thickened and reflected, its extremities connected by a thick callus; columella dentate.
West Indian.
6. *VERTIGO*, Müller. Minute, cylindrical apex acuminate, obtuse; lip expanded, white. Animal without inferior tentacles.
7. *ZOOGENITES*, Morse. Minute, turritid, conical, acutely ribbed longitudinally. Ovoviviparous.

CIONELLA.

Subgenera.

- ZUA*, Leach. Ovate-oblong, imperforate, smooth, pellucid, golden, shining; aperture small; lip obtuse, its extremities joined by a callus; columella more or less truncate.
- ACICULA*, Leach. Elongate, imperforate, white, vitreous, spire turritid, apex slightly obtuse; aperture oblong, lip simple, acute; columella subarcuate, truncate at base.

ZUA, Leach.

1. *Zua subcylindrica*, Chemnitz.

Plate 14, figure 14.

Shell oblong-oval, thin, polished, transparent; whorls 6, slightly convex, apex obtuse, sutures well marked; aperture oval, longitudinal, lip thickened but not reflected; umbilicus impervious. Bright amber color.

Length 7·5, diam. 2·5 mill.

Inhabits from New England and the Middle States to Lake of the Woods and the far Western Territories.

ACICULA, Leach.

1. *Acicula acicula*, Müller.

Plate 14, figure 13.

Cylindrical, acicular, spire attenuated, apex obtuse, suture narrowly margined; whorls 6 or 7, flat; aperture narrow, lip acute, columella arcuate. Hyaline, polished.

Length 4, diam. 1 mill.

European; introduced with imported plants, and sparingly distributed in a few places in the vicinity of greenhouses. Becoming naturalized.

This is an European species, introduced originally with imported plants; it has been found frequently in greenhouses, and lately, by Mr. A. D. Brown, of Princeton, N. J., in his garden.

STENOGYRA.*Subgenera.*

RUMINA, Risso. Cylindrically elongate, truncate at apex, whorls remaining 4 or 5, smooth, shining; aperture semi-oval, lip margined within, not expanded, its extremities joined by a callus, columella not truncate; rimate.

OPEAS, Albers. Elongated, thin, striate, shining; whorls 6—8, the last compressed, perforate; aperture ovate oblong, equalling one-third to one-fourth of the total length, lip simple, acute, columellar margin reflexed.

MELANIELLA, Pfeiffer. Elongated, imperforate, costate; aperture ovate, effused at base, peristome simple, subcontinuous.

1. *Rumina decollata*, Linnæus.

Plate 14, figure 15.

Shell cylindrically turritid, rather thick, smooth, semitransparent; apex truncated, leaving 4 or 5 nearly flat whorls; aperture oval, angular above; outer lip thickened but not reflected, columellar lip reflected; umbilicus imperforate. Bright amber color.

Length (truncated) 25, diam. 10 mill.

Charleston, S. C.

This is a common European species, which has been introduced into various parts of the old and new world. In Charleston it is very numerous, though not found elsewhere in the United States.

2. *Opeas subula*, Pfeiffer.

Plate 14, figure 17.

Shell elevated, transparent: whorls 8, well rounded, the apex obtuse; aperture small, oval; base minutely perforated. White or yellowish.

Length 12, diam. 2.5 mill.

Florida (from Cuba).

3. *Melaniella gracillima*, Pfeiffer.

Plate 14, figure 16.

Elongated cylindrical, thin, with 20 to 30 sharp longitudinal ribs on each whorl; whorls 8, flattened, the suture deeply impressed, apex obtuse; the last whorl is angular below the middle; aperture small, elongated, oval, lip and columella both nearly perpendicular. White.

Length 7.5, diam. 1.6 mill.

Florida (from Cuba).

MACROCERAMUS, Guilding.

This genus belongs peculiarly to the West Indian fauna, and the species mentioned below are only stragglers from it into the subjacent parts of the United States.

1. *Macroceramus Pontificus*, Gould.

Plate 14, figure 20.

Fusiformly cylindrical, apex acuminate; whorls 9 to 12, slightly rounded, closely obliquely costulate: suture impressed, crenulate; aperture small, obliquely rounded, lip slightly reflected; base with a raised or carinated revolving line. White with brown and bluish clouds or bands crossing the whorls obliquely, and a colored band upon the carinae.

Length 13, diam. 5 mill.

Florida.

2. *Macroceramus Gossei*, Pfeiffer.

Plate 14, figures 18, 19.

Fusiformly cylindrical, obliquely costulate; whorls 6, convex, sutures crenulate; aperture obliquely rounded, the lip slightly expanded; base subangulate, rimate. White with curved oblique dark bands and corneous dots; sometimes the markings are obsolete.

Length 11, diam. 3.6 mill.

Texas (Coll. Menke).

PUPA, Draparnaud.

Subgenera.

PUPILLA, Leach. Cylindrical, apex obtuse; whorls 5—9, corneous, somewhat shining; aperture rounded, lip expanded, scarcely reflected, armed with teeth within or without teeth.

LEUCOCHILA, Albers. Cylindrically ovate, apex somewhat obtuse, smooth, pellucid, shining; aperture semioval, edentulous, or armed with teeth or plications, lip thickened, reflexed; rimate.

Genus PUPILLA, Leach.

1. *Pupilla badia*, Adams.

Plate 15, figure 2.

Shell subcylindrical, with an obtuse apex; whorls about 6, moderately well rounded, with well-marked suture; aperture small, rounded, with a small tubercle on the parietal wall, and occasionally a tooth on the base of the lip; umbilicus perforate. Dark chestnut color.

Length 3, diam. 1.5 mill.

New England States.

It has been confounded with *P. muscorum*, of Europe, by some American and foreign naturalists, but differs in being larger with a less thickened lip.

2. *Pupilla Hoppii*, Möller.

Plate 15, figure 3.

Obtusely fusiform, whorls 5, very much rounded, with deep suture; aperture small, quadrately oval, with a small tooth on the parietal wall, and a tubercular thickening on the columellar portion of the lip; surface coarsely striate.

Greenland.

I have never seen this species, and the above description is made up from the only published figure of it. Möller's description is very short and meagre.

3. *Pupilla Blandi*, Morse.

Plate 15, figure 4.

Ovately cylindrical, apex obtuse; whorls 6, well rounded, with deep suture; aperture rounded, small, the lip subreflected, with a tooth on the parietal wall, one on the columellar portion, and a third remote within the base.

Length 3, diam. 1.5 mill.

Drift on Missouri River, near Fort Berthold.

4. *Pupilla variolosa*, Gould.

Plate 15, figure 5.

Ovately conical, apex obtuse, whorls 5, well rounded, with a profound suture; surface thickly and irregularly pitted with small round indentations, aperture small, obliquely oval, with lip slightly reflected, with a revolving lamellar tooth, a tooth on the columella and another on the base. Yellowish green.

Length 2 mill.

East Florida.

5. *Pupilla pentodon*, Say.

Plate 15, figure 6.

Ovately conical, with subacute apex, whorls 5, well rounded with deep suture; aperture small, obliquely rounded, lip expanded, but not reflexed, with a white callous inner margin

armed with two teeth on the columella, of which the upper one is largest, and from two to seven teeth on the outer lip, while one to two teeth are situated on the parietal wall. Light horn color.

Length 2 mill.

Maine to Ohio and southwards to Georgia.

The number of teeth developed on the lip increases with age from the minimum to the largest number mentioned above.

6. *Pupilla decora*, Gould.

Plate 15, figure 7.

Ovately cylindrical, apex obtuse; whorls 6, well rounded, with deep sutures; surface shining; aperture small, rounded, armed with 4 teeth, one on the parietal wall, one on the columella, the third on the base and the fourth on the outer lip; perforate; light amber color.

Length 2.5, diam. 1.3 mill.

Vicinity of Lake Superior.

7. *Pupilla Rowelli*, Newcomb.

Plate 15, figure 8.

Ovately fusiform, apex subacute; whorls 5, moderately rounded, with impressed suture; aperture small, oval, with a parietal, a basal, a columellar and an outer lip tooth; of these the basal is largest, and that on the parietal margin the next largest.

California.

8. *Pupilla Californica*, Rowell.

Plate 15, figure 9.

Ovately cylindrical, apex obtuse, whorls 5, slightly convex, with rib-like striæ; aperture quadrately oval, with a tooth on the parietal margin, another on the columellar, a third on the basal, and a fourth on the outer margin.

California.

Distinguished from *P. Rowellii* by its more obtuse outline, raised striæ and smaller basal tooth. Its striæ distinguish it principally from *P. decora*, Gould.

Genus **LEUCOCHILA**, Albers.**1. Leucochila marginata**, Say.

Plate 15, figure 11.

Ovately turritid, spire rather obtuse, whorls 6, well rounded, smooth; aperture rounded, with widely reflected lip; perforate. Dark brown.

Length 6, diam. 2.5 mill.

Eastern, Middle and Western States.

More cylindrical than the following, with wide-margined white lip.

2. Leucochila fallax, Say.

Plate 15, figure 10.

Ovately turritid, apex acuminate; whorls 6, well rounded, smooth; aperture rounded, large, lip expanded but not reflected, without teeth; umbilicus perforate. Dark brown.

Length 5, diam. 2.5 mill.

Eastern and Middle States.

This species, described by Mr. Say as distinct from his *P. marginata*, has since been confounded with it. I was luckily able to point out the difference between them in *Am. Jour. Conchology*, i. p. 285.

3. Leucochila Arizonensis, Gabb.

Plate 15, figure 12.

Pupoid or cylindrical, with obtuse apex, suture well impressed; whorls $5\frac{1}{2}$, convex, smooth, translucent; aperture suboval, edentate, lip thickened, strongly reflected, slightly emarginate near the posterior termination; imperforate. Corneous, lip white.

Length 5, diam. 2 mill.

Fort Grant, Arizona. Pike's Peak in the Rocky Mountains.

4. *Leucochila hordacea*, Gabb.

Cylindrical, apex obtuse; whorls 6, convex, with well impressed suture, smooth, thin; aperture small, edentulous; lip narrowly reflected and white; base umbilicate, the umbilicus bounded by an angle.

Length 2.8, diam. 1.1 mill.

Fort Grant, Arizona.

5. *Leucochila modica*, Say.

Plate 15, figure 14.

Ovately conical, fragile, spire acute; whorls 5, convex; aperture small, oval, lip turned over but not flattened, without teeth; imperforate. Pale horn color.

Length 2.5, diam. 1.5 mill.

Florida.

6. *Leucochila armifera*, Say.

Plate 15, figure 15.

Subfusiform, smooth, apex obtuse; whorls 6 to 7, with moderately impressed sutures; aperture small, oval, with widely reflected lip, much thickened within, its extremities nearly joined, connected by a callus deposit on the parietal margin; teeth generally four in number, namely, a parietal tooth, which is lamellar, large, and has one or more projecting points or is sometimes bifid, a rounded tooth on the left side, remote from the margin, and two others on the outer lip near its base; base of shell keeled, umbilicus perforate. Light horn color.

There are occasionally, in addition to the above, a distant tooth in the base of the aperture, and a marginal one near the top of the outer lip.

Length 5, diam. 2.5 mill.

Vermont to Kansas and southward to Kentucky.

7. *Leucochila contracta*, Say.

Plate 15, figure 16.

Subconical; whorls 6, with moderately impressed sutures; aperture small, trigonal, the margin continuous, reflected, much thickened within, the throat nearly filled by the large teeth which include an irregular one on the parietal margin, projecting into the aperture and concave on its right side, a tubercle on the umbilical side and another in the base, and a raised tooth on the outer margin of the lip; base keeled, minutely perforate. Light horn color.

Length 2·5, diam. 1·3 mill.

Maine to Iowa and southward to Florida and Texas.

8. *Leucochila rupicola*, Say.

Plate 15, figure 17.

Narrow, cylindrically fusiform, apex obtuse; whorls 6, slightly convex; aperture small, oval, the lip thickened within and widely reflected: teeth five in number, namely, one on the parietal wall, large and emarginate (sometimes deeply), a conical one, sometimes divided, on the umbilical margin, the third at the base, the fourth on the outer lip, and the fifth deeply seated within the outer lip; frequently all the teeth but the first two are wanting; umbilicus minutely perforate. Brownish.

Length 2·5, diam. 1·2 mill.

Pennsylvania to Florida, Arkansas.

9. *Leucochila corticaria*, Say.

Plate 15, figure 18.

Subcylindrical, apex obtuse, whorls five, convex, with well-impressed sutures; aperture small, rounded, with white, reflected lip, on the parietal wall is a small tooth, or rarely two teeth, and the umbilical side of the lip is also partially dentate, although occasionally both teeth are wanting. Substance thin and translucent, whitish,

Length 2·5, diam. 1·3 mill.

Northern, Middle and Western States; Mississippi.

10. *Leucochila pellucida*, Pfeiffer.

Plate 15, figure above 24.

Cylindrical, thin, shining, pellucid, apex obtuse; whorl five, convex, aperture semi-oval, five-toothed, one on the parietal wall, one on the columella, two on the middle of the outer lip, and a minute one on its base; lip simple, expanded. Light corneous.

Length 2, diam. 1 mill.

Texas?

This is a Cuban species, quoted from Texas by Röemer. It may be doubted whether the specimens collected by this gentleman were really the same as the Cuban shell.

STROPHIA.**1. *Strophia incana*, Binney.**

Plate 15, figure 19.

Cylindrical, thick, opaque, apex obtuse; whorls eight to twelve, flattened, suture not deep; more or less heavily striate, sometimes almost smooth; aperture small, rounded-oval, lip white, thickened and reflected with a callus deposit bearing a tooth on the parietal wall and on the columella; base imperforate, carinate, with the striæ well developed. White, with sometimes irregular black flames or zig-zag markings.

Length 25—31, diam. 10 mill.

Florida and Cuba.

This is the only representative in our country of a numerous group of large species, inhabiting several West India Islands, but attaining their greatest development in Cuba.

VERTIGO.**1. *Vertigo Bollesiana*, Morse.**

Plate 15, figure 25.

Ovate-cylindrical, apex obtuse; whorls four, well rounded, with impressed suture; aperture sub-trigonal, with a curved parietal tooth, two columellar teeth, the lower one the smallest, and two transverse lamelliform teeth within the outer lip and at its middle and base; lip thickened and subreflected; axis perforate.

Length 1.7, diam. 9 mill.

Maine, New Hampshire, Massachusetts, New York, Norfolk, Va.

Smaller than *V. Gouldi*, which it much resembles; it differs in the outer lip not being smooth in the middle.

2. *Vertigo corpulenta*, Morse.

Plate 15, figure 24.

Ovate, striate, polished, translucent, apex obtuse; whorls four, very convex, with deep suture; aperture rounded, truncated by the parietal wall, lip slightly thickened and reflected; teeth four, small and obtuse, one on parietal wall, one on the columellar margin, one on the middle of the labrum and one near its base.

Length 2.5, diam. 1.3 mill.

Little Valley, Washoe Co., Nevada, Eastern slope of Sierra Nevada, alt. 6500 ft.

3. *Vertigo Gouldi*, Binney.

Plate 15, figure 20.

Ovate-cylindrical, apex obtuse; whorls four, convex, with well marked sutures; aperture semi-oval, truncated above by the parietal wall, the outer lip sub-reflexed, and incurved in the middle; there are two sharp teeth on the umbilical lip, two more within the outer lip and one on the parietal wall; umbilicus perforate. Chestnut color.

Length 2, diam. 1 mill.

New England and Middle States.

4. *Vertigo milium*, Gould.

Plate 15, figure 21.

Ovate with obtuse apex; whorls five, well rounded, with deep sutures; aperture semi-oval, truncated above, outer lip incurved in the middle, lip white and reflected, parietal wall covered with callus; there are two sharp teeth on the parietal wall, a broad tooth on the umbilical margin, with occasionally one or two little tubercles near its base, one in the base of the aperture and two

on the outer lip; umbilicus open, rather large. Chestnut color.

Length .90, diam. .65 mill.

Inhabits nearly the whole country east of Mississippi River.

5. *Vertigo ovata*, Say.

Plate 15, figure 22.

Ovate conical, ventricose, apex conical, whorls five, very convex, with deep suture; aperture half round, truncate above, lip thickened within and reflected, marked externally by a groove, outer lip incurved in the middle; teeth six to eight, a large sharp one and a small one on the parietal wall, two on the columellar margin, one of them at its base, and two on the labrum, one of which is also basal; umbilicus open. Dark amber colored, shining.

Length 1.8, diam. 1 mill.

Northern United States.

6. *Vertigo simplex*, Gould.

Plate 15, figure 23.

Cylindrical, apex obtuse; whorls five, well rounded, with deep suture; aperture rounded, peristome nearly continuous, scarcely reflected, without teeth; umbilicus nearly covered by the lip. Dark brown.

Length 1.6, diam. .8 mill

Maine to Pennsylvania.

7. *Vertigo ventricosa*, Morse.

Plate 15, figure 26.

Ovate-conic, smooth and shining, apex obtuse; whorls four, very convex, with deep suture; aperture small, rounded triangular, the middle of the outer lip incurved, lip widely reflected and thickened within; there is one large tooth on the parietal wall, another occupies the columellar lip, with a smaller one near its base, and there are two large teeth on the outer lip, making five in all; umbilicus smooth. Light chestnut color.

Length 1.6, diam. 1 mill.

Maine, New Hampshire, Mohawk and Greenwich, New York.

ZOOGENITES, Morse.

1. *Zoogenites harpa*, Say.

Plate 15, figure 1.

Ovate-conic, apex acute, thin, translucent, covered with sharp, thin, blade-like longitudinal ribs, apex acute and smooth, whorls four, convex, with impressed suture; aperture large, obliquely semi-circular, without teeth, lip not reflected; umbilicus minutely perforated. Light horn color.

Length 5, diam. 3.5 mill.

Maine to Iowa.

This is a boreal species, and has not been met with south of the above localities, I believe. It much resembles, except in size, *Helix Idahoensis*, Newcomb.

 Family CYLINDRELLIDÆ.

Shell cylindrical, multispiral, truncate, frequently costate; aperture small, subcircular, edentulous, peristome expanded, continuous.

 CYLINDRELLA, Pfeiffer.

Subgenera.

GONGYLOSTOMA, Albers.—Cylindrically fusiform, apex attenuate, costulate or striate, whorls 9—20, the last more or less protracted, obsoletely angulate; aperture circular, lip expanded.

HOLOSPIRA, Albers.—Shell turritid or fusiform, apex conical, not truncate; whorls 11—14, the last not protracted, base carinate; aperture subquadrangular, peristome expanded, columella plicate.

 Genus GONGYLOSTOMA, Albers.
1. *Gongylostoma Poeyana*, Pfeiffer.

Plate 15, figure 27.

Elongate, thin, longitudinally sharply striate; spire very long, acuminate and truncate at the apex; whorls eleven, slightly con-

vex; the last carinate at base; aperture rounded with continuous, acute lip. Corneous.

Length 15, diam. 4 mill.

Florida.

2. *Gongylostoma jejuna*, Gould.

Plate 15, figure 28.

Small, fusiformly elongate, solid, attenuate and truncated at apex; whorls about nine remaining, convex, with well impressed suture, the last whorl carinate at base; aperture campanulate, the lip continuous and not in contact with preceding whorl. Light horn color, with narrow longitudinal white lines.

Length 10, diam. 2.5 mill.

Florida.

3. *Gongylostoma Coahuilensis*, W. G. Binney.

Plate 15, figure 29.

Cylindrical, ventricose, thin, apex conically obtuse; whorls twelve, the upper ones smooth, the middle ones striate, the last two strongly ribbed, attenuated at base and not carinate; aperture subquadrate, with continuous peristome. White.

Length 29, diam. 7, mill.

Coahuila, Mexico.

Genus HOLOSPIRA, Albers.

1. *Holospira Roëmeri*, Pfeiffer.

Subcylindrical, apex obtusely conical, not truncate, substriate; whorls fourteen, flattened, the last carinate at the base, twisted downwards and free from the preceding whorl; the aperture with narrowly expanded lip, which is continuous, with a plica within. Pinkish white.

Var. β . smaller, more ventricose, whorls 12, the last less free.

Length 13—14, diam. 4.5 mill.

New Braunfels, Texas.

2. *Holospira Goldfussi*, Menke.

Plate 15, figure 31.

Elongate, swelled in the middle; apex conic, not truncated; thin, translucent, lightly striate; whorls twelve, flat, narrow, the last carinated at base; aperture obliquely sub-triangular, lip slightly expanded, continuous. Light horn color.

Length 11, diam. 4.4 mill.

Texas.

3. *Holospira Remondi*, Gabb.

Plate 15, figure 32.

Oblong-elliptical, subtruncated, whorls twelve, the first two and a half smooth, the rest densely obliquely striate, the last whorl convex at the base, aperture round, with reflected lip; umbilicus minute. White.

Length 11, diam. 3 mill.

Sonora, Mexico.

4. *Holospira Pfeifferi*, Menke.

Plate 15, figure 34.

Oblong-ovate, thin, pellucid, densely obliquely striate; spire oblong, conical, apex obtuse; whorls twelve, convex, subcompressed at the base; aperture rounded, peristome shortly reflected. White.

Length 17.5, diam. 5.6 mill.

Sonora, Mexico.

Larger, with fewer and larger striæ than *H. Rémondi*; the the whorls also are more rounded.

5. *Holospira irregularis*, Gabb.

Plate 15, figure 30.

Cylindrical, slender, whorls sixteen to eighteen, slightly convex, the last one subangulated below; suture slightly impressed; minutely umbilicate; aperture small, subquadrate, lip slightly expanded; surface with small longitudinal ribs. Color light brown.

Length 25, diam. 5 mill.

Lower California.

6. *Holospira Newcombiana*, Gabb.

Plate 15, figure 33.

Large, slender, tapering; whorls eleven and a half, flattened, the last subangular in the middle; aperture with widely expanded lip which is continuous; surface with fine irregular, undulating and occasionally broken ribs, radiately and obliquely disposed, the interstices crossed by microscopic revolving lines.

Length 1.9 inch, diam .35 in.

Lower California.

Family LIMACIDÆ.

This Family includes the so-called naked snails or slugs, which possess a small shield-like shell concealed beneath the mantle of the animal.

The following Family, *Arionidæ*, possesses a few calcareous agglomerated granules only, instead of the shell; and the third family of Snails, the *Philomycenidæ*, have no vestige of a shell.

LIMAX.

Subgenera.

EULIMAX, *includes species Nos. 1, 2, 3 and 4.*

AMALIA, *includes species No. 5.*

1. *Limax flavus*, Linn.

Plate 16, figure 3.

Yellowish brown, covered with lighter colored longitudinally-disposed spots; surface granulate, the granules smaller and concentrically arranged upon the mantle; posterior termination acute and keeled. Base dirty white.

Length 3 to 4 inches when fully extended.

Seaports, (introduced from Europe) inhabiting cellars.

2. *Limax maximus*, Linn.

Plate 16, figure 2.

This very large French Snail has been found recently in cellars in Philadelphia, in such numbers as to warrant the belief that it has become a permanent addition to our mollusca. The figure is from a living specimen.

3. *Limax agrestis*, Müller.

Plate 17, figures 14, 15, 16.

Much smaller than the preceding; color varying from white through all shades of yellowish and grayish to brown or black, with or without small black dots, the mantle sometimes mottled with lighter color, white beneath. Upper surface somewhat rugose.

Length 1 to 2 inches.

Cities on the coast and their vicinity. (From Europe).

4. *Limax campestris*, Binney.

Plate 17, figures 11, 12, 13.

Cylindrical, elongated, thin; color black, lead or brownish, without spots; mantle finely concentrically striated, back prominently tuberculated.

Length one inch.

Northern and Western States. Indigenous.

5. *Limax Columbianus*, Gould.

Plate 16, figure 1.

Thick, carinated and obtusely pointed behind; foot wide, margining the body and furbelowed, with transverse oblique striæ, body longitudinally corrugated, mantle finely granulated; color dark greenish yellow, sometimes with large purplish black blotches.

Length five inches.

Neighborhood of Puget's Sound, Oregon.

Family ARIONIDÆ.

ARION.

*Subgenera.*PROLEPIS. *Species No. 1.*ARIOLIMAX, Mörch. *Species No. 2.***1. Arion fuscus, Müller.**

Plate 17, figures 9—10.

Light ash color, sometimes obscurely banded lengthwise; body cylindrical, narrow, its posterior extremity flat and rounded; upper surface longitudinally corrugated; head darker than the body, tentacles blackish.

Length one to two inches.

Maritime cities and their vicinity. (From Europe).

2. Arion foliolatus, Gould.

Plate 17, figure 1.

Reddish fawn color, coarsely obliquely reticulated with slate-colored lines; mantle concentrically marked with slate color, foot projecting around and forming a border to the body which is obliquely lineated; tentacles small and short.

Length three and a half inches.

Neighborhood of Puget's Sound, Oregon.

Family PHILOMYCENIDÆ.

TEBENNOPHORUS, Binney.

1. Tebennophorus Carolinensis, Bosc.

Plate 17, figure 6.

Whitish or yellowish-white, sometimes unmarked, but generally with clouds or spots of brown or black, forming three ill-defined longitudinal bands; tentacles blackish, surface longitudinally rugose.

Length three to four inches.

New England States to South Carolina, and westward to Missouri.

2. Tebennophorus dorsalis, Binney.

Plate 17, figures 7, 8.

Cylindrical, ashy blue with a black band on the middle of the back, tentacles black; surface minutely longitudinally rugose. the posterior termination acute.

Length 18 mill.

Found in woods. Vermont, near Boston, near Philadelphia, (Tryon).

Family VERONICELLIDÆ.

VERONICELLA.

1. Veronicella Floridana, Binney.

Plate 17, figures 2—5.

Elongate oval, extremities rounded; back arched, slightly wrinkled, dark ashy gray mottled with black, with a white line in the middle and an ill-defined black band at a little distance on each side of it; tentacles short, annulated, the lower ones indistinctly bifurcate; drab color below.

Length 56 mill.

Meta-lee-chee Key, Charlotte Harbor, West coast of Florida, under moist earth.

Family ONCHIDIIDÆ.

ONCHIDIUM.

1. Onchidium Carpenteri, W. G. Binney.

Plate 18, figure 39.

Lower California.

ACICULA.

- Fig. 13. A. ACICULA, Müller. Hist. Verm. ii. p. 150.
 Reeve, Conch. Icon. t. 20, f. 111.
 Forbes and Hanley, Brit. Moll. iv. p. 130, t. 128,
 f. 4. No. 1.

ZUA.

- “ 14. Z. SUBCYLINDRACEA, Chemnitz. Conch. Cab.
 ix. p. 167, t. 135, f. 1235.
Achatina lubrica, Müller. Binney, Terr. Moll.
 ii. p. 283, t. 52, f. 4 (1851).
Bulimus lubricoides, Stimpson. Shells of New
 England, p. 54. No. 1.

RUMINA.

- “ 15. R. DECOLLATA, Linnæus. Syst Nat. p. 1247.
 Binney, Terr. Moll. ii. p. 280, t. 50, f. 1 (1851).
Bulimus mutilatus, Say. Jour. Acad. Nat. Sci.
 ii. p. 373. No. 1.

MELANIELLA.

- “ 16. M. GRACILLIMA, Pfeiffer. Wiegman's Archiv.
 für Naturgesch. i. p. 352 (1839).
 Binney, Terr. Moll. ii. p. 293, t. 53, f. 3 (1851).
Achatina striato-costata, D'Orbigny. Moll. Cuba,
 i. p. 176, t. 11, f. 21. No. 1.

OPEAS

- “ 17. O. SUBULA, Pfeiffer. Wiegman's Archiv. für
 Naturgesch. i. p. 352 (1839).
 Binney, l. c. p. 285, t. 53, f. 4 (1851).
Bulimus octonoides, D'Orbigny. Moll. Cuba, i.
 p. 177, t. 11, f. 23, 24. No. 1.

MACROCERAMUS.

- “ 20. M. KIENERI, Pfeiffer. Proc. Zool. Soc. p. 40
 (1846).
 Reeve, Conch. Icon. Bulimus, t. 66, No. 463.
Pupa pontifica, Gould. Bost. Proc. iii. p. 40
 (1848).
Cylindrella pontifica, Gould. Binney, l. c. ii. p.
 306, t. 69, f. 1 (1851). No. 1.

Fig. 18, 19. M. GOSSEI, Pfeiffer. Proc. Zool. Soc. p. 137
(1845).

Reeve, Conch. Icon. *Bulimus*, t. 66, f. 462. No. 2.

PUPADÆ.

SYNONYMY AND REFERENCE TO

PLATE 15.

ZOOGENITES.

- “ 1. Z. HARPA, Say. Exped. St. Peters, ii. p. 256
(1824).
Bulimus harpa, Binney, l. c. ii. p. 290, t. 52, f.
3 (1851).
Zoogenites harpa, Morse. Shells of Maine, p.
32 (1864).
Pupa costulata, Mighels, Bost. Proc. i. p. 187. No. 1.

PUPILLA.

- “ 2. P. BADIA, Adams. Bost. Jour. iii. p. 331, t. 13,
f. 18.
Binney, l. c. ii. p. 323, t. 70, f. 3 (1851).
= *Pupa muscorum*, Linn. teste Pfeiffer. Monog.
Helic. Viv. No. 1.
- “ 3. P. HOPPII, Möller. Index Moll. Grœnl. p. 4
(1842).
W. G. Binney, l. c. iv. p. 147, t. 78, f. 20, 1859. No. 2.
- “ 4. P. BLANDI, Morse. Ann. N. Y. Lyc. Nat. Hist.
viii. p. 211 (1865). No. 3.
- “ 5. P. VARIOLOSA, Gould. Proc. Bost. Soc. iii. p. 40
(1848).
Binney, l. c. ii. p. 331. t. 72, f. 2 (1851). No. 4.
- “ 6. P. PENTODON, Say. Jour. Acad. Nat. Sci. ii. p
376.
Binney, l. c. ii. p. 328, t. 72, f. 1 (1851).
Pupa curvidens, Gould. Invert. Mass. p. 189.
Pupa Tappaniana, Adams. Moll. Vermont. No. 5

- Fig. 7. P. DECORA, Gould. Bost. Proc. ii. p. 263 (1847).
Binney, l. c. ii. p. 327, t. 71, f. 3 (1851). No. 6.
- “ 8. P. ROWELLI, Newcomb. Ann. Lyc. Nat. Hist.
vii. p. 146.
Bland, Ann. Lyc. Nat. Hist. viii. p. 166 (1865). No. 7.
- “ 9. P. CALIFORNICA, Rowell. Ann. Lyc. Nat. Hist.
vii. p. 287.
Bland, Ann. Lyc. Nat. Hist. viii. p. 166 (1865). No. 8.

LEUCOCHILA.

- “ 11. L. MARGINATA, Say.
Cyclostoma marginata, Say. Jour. Acad. Nat.
Sci. ii. p. 72.
Bulimus marginatus (pars), W. G. Binney, l. c.
iv. p. 136 (1859).
Bulimus fallax, Gould (pars). Binney, l. c. ii.
p. 288 (1851).
Pupa albilabris, Adams. Moll. Vermont.
Bulimus marginatus, Say. Tryon, Am. Jour.
Conch. i. p. 286 (1865). No. 1.
- “ 10. L. FALLAX, Say. Jour. Acad. Nat. Sci. v.
(1825).
Bul. marginatus (pars), W. G. Binney, l. c. iv. p.
136 (1859).
Pupa fallax, Gould (pars). Binney, l. c. ii. p.
288 (1851).
Bulimus fallax, Say. Tryon, Am. Jour. Conch.
i. p. 286 (1865). No. 2.
- “ 12. L. ARIZONENSIS, Gabb. Am. Jour. Conch. ii.
p. 331, t. 21, f. 6 (1866). No. 3.
- “ —. L. HORDACEA, Gabb. Am. Jour. Conch. ii. p.
331, t. 21, f. 7 (1866). No. 4.
- “ 14. L. MODICA, Gould. Proc. Bost. Soc. iii. p. 40
(1848).
Binney, l. c. ii. p. 319, t. 52, f. 2 (1851). No. 5.
- “ 15. L. ARMIFERA, Say. Jour. Acad. Nat. Sci. ii. p.
162.
Binney, l. c. ii. p. 320, t. 70, f. 4 (1851). No. 6.
- “ 16. L. CONTRACTA, Say. Jour. Acad. Nat. Sci. ii.
p. 374.
Binney l. c. ii. p. 324, t. 70, f. 2 (1851).
Pupa deltostoma, Charpentier. Chemnitz, Conch.
Cab. nov. edit. p. 181, t. 21, f. 17—19. No. 7.

- Fig. 17. *L. RUPICOLA*, Say. Jour. Acad. Nat. Sci. ii. p. 163.
 Binney, l. c. ii. p. 341, t. 70, f. 1 (1851).
Pupa procera, Gould. Bost. Jour. iii. p. 401, t. 3, f. 12.
Pupa carinata, Gould. Cover of Bost. Jour. iv. Part 1.
Pupa gibbosa, Chemnitz. Edit. 2, p. 123, t. 16, f. 13—16.
Pupa minuta, Say. Pfeiffer, Monog. Hel. ii. p. 356 (1848). No. 8.
- “ 18. *L. CORTICARIA*, Say (*Odostomia*). Nicholson's Encyc. iv. t. 4, f. 5.
 Binney, l. c. ii. p. 339, t. 72, f. 4 (1851). No. 9.
- “ 26. *L. PELLUCIDA*, Pfeiffer. Symbolæ, i. p. 46.
 Küster, Chemnitz Conch. Cab. p. 89, t. 12, f. 24, 25. No. 10.

STROPHIA.

- “ 19. *S. INCANA*, Binney. Terr. Moll. iii. t. 68 (1851).
 W. G. Binney, l. c. iv. p. 141 (1859).
Pupa maritima (not of Pfeiffer). Gould in Terr. Moll. l. c. ii. p. 316 (1851).
Pupa detrita, Shuttleworth. Bern. Mittheil. No. 1.

VERTIGO.

- “ 20. *V. GOULDI*, Binney. Bost. Proc. i. p. 105 (1843).
 Binney, Terr. Moll. ii. p. 332, t. 71, f. 2 (1851). No. 3.
- “ 21. *V. MILIUM*, Gould. Bost. Jour. iii. p. 402, t. 3, f. 23.
 Binney, l. c. ii. p. 337, t. 71, f. 1 (1851). No. 4.
- “ 22. *V. OVATA*, Say. Jour. Acad. Nat. Sci. ii. p. 375.
 Binney, l. c. ii. p. 334, t. 71, f. 4 (1851).
modesta, Say.
Pupa ovulum, Pfeiffer (olim). Symbolæ, i. p. 46. No. 5.
- “ 23. *V. SIMPLEX*, Gould. Bost. Jour. iii. p. 403, t. 3, f. 21.
 Binney, l. c. ii. p. 343, t. 72, f. 3 (1851). No. 6.

- Fig. 24. V. CORPULENTA, Morse. Ann. N. Y. Lyc. viii.
p. 210 (1865). No. 2.
- " 25. V. BOLLESIANA, Morse. Ann. N. Y. Lyc. viii.
p. 209 (1865). No. 1.
- " 26. V. VENTRICOSA, Morse. Ann. N. Y. Lyc. viii.
p. 207 (1865). No. 7.

GONGYLOSTOMA.

- " 27. G. POEYANA, D'Orbigny. Moll. Cuba, i. p. 185,
t. 12, f. 24—26.
Cylindrella lactaria, Gould. Binney, l. c. iii. t.
69, f. 2.
C. lactaria of text in Binney, ii. p. 309 = *varie-*
gata, Pfeiffer. No. 1.
- " 28. G. JEJUNA, Gould. Bost. Proc. iii. p. 41 (1848).
Binney, l. c. ii. p. 310, t. 69, f. 3 (1851). No. 2.
- " 29. G. COAHUILENSIS, W. G. Binney. Am. Jour.
Conch. i. p. 50. t. 7, f. 4, 5 (1865). No. 3.

HOLOSPIRA.

- H. ROEMERI, Pfeiffer. Monog. Hel. Viv. ii. p.
383. No. 1.
- " 30. H. IRREGULARIS, Gabb. Am. Jour. Conch. iii.
p. 238, t. 16, f. 4 (1857).
W. G. Binney, l. c. iv. p. 150 (1859). No. 5.
- " 31. H. GOLDFUSSI, Menke. Zeit. für Malak. p. 2
(1847).
W. G. Binney, l. c. iv. p. 151, t. 79, f. 33 (1859). No. 2.
- " 32. H. REMONDI, Gabb. Am. Jour. Conch. i. (1865). No. 3.
- " 33. H. NEWCOMBIANA, Gabb. Am. Jour. Conch.
iii. p. 237, t. 16, f. 3 (1867). No. 6.
- " 34. H. PFEIFFER, Menke. Zeitsch für Malakologie,
p. 1 (1847). No. 4.

SNAILS.

SYNONYMY AND REFERENCE TO

PLATE 16.

- Fig. 1. LIMAX COLUMBIANUS, Gould. Binney, l. c. ii.
p. 43, t. 66, f. 1 (1852).
Mollusca, Wilkes' Expl. Exped. p. 3, f. 1, a, b, c
(1852). No. 5.
- " 2. LIMAX MAXIMUS, Linn. Syst. Nat. ed. 10, i. 652
(1758). No. 2.
- " 3. LIMAX FLAVUS, Linnæus. DeKay, Moll. New
York, p. 21, t. 1, f. 5 (1843).
Limax variegatus, Draparnaud. Binney, l. c. ii.
p. 34, t. 65, f. 1 (1852). No. 1.

SNAILS.

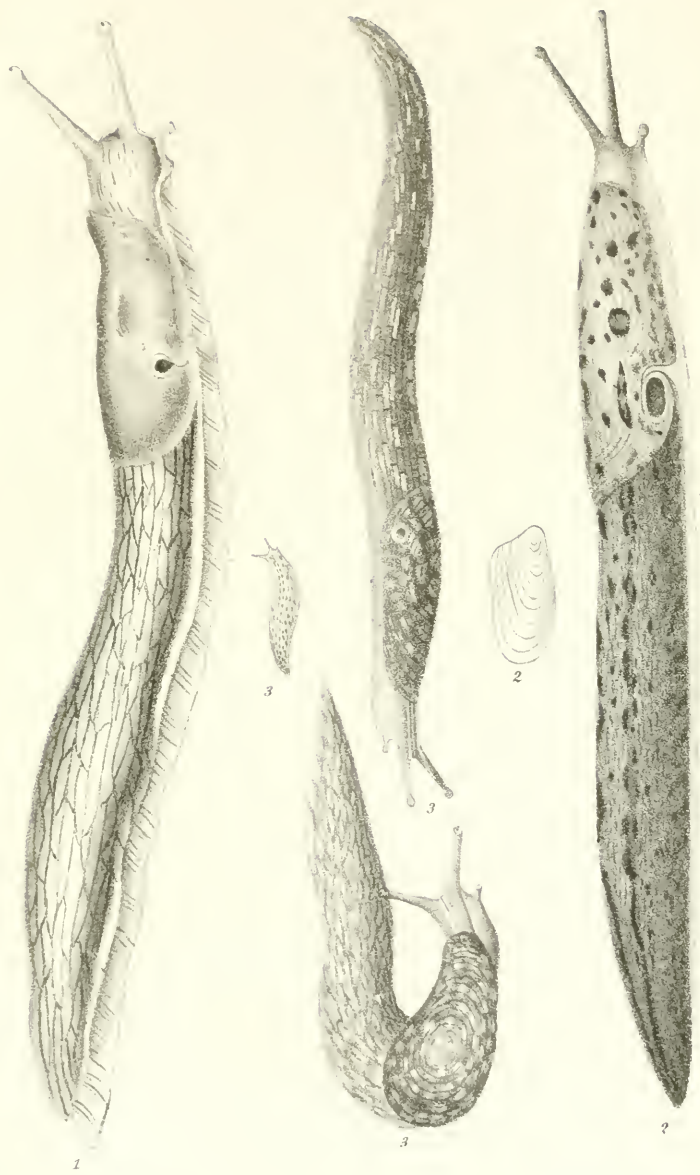
SYNONYMY AND REFERENCE TO

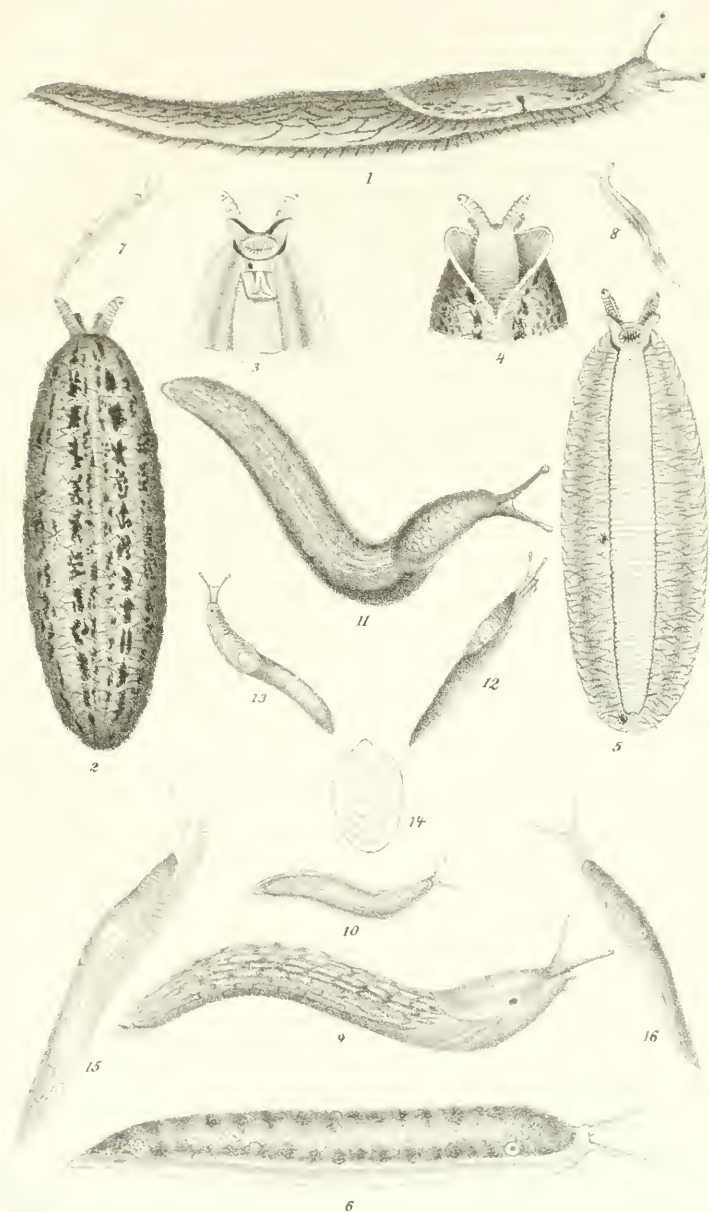
PLATE 17.

- Fig. 1. ARION FOLIOLATUS, Gould. Binney, l. c. ii. p.
30, t. 66, f. 2 (1852).
Mollusca of Wilkes' Expl. Exped. p. 2, f. 2, a, b
(1852). No. 2.
- " 2—5. VERONICELLA FLORIDANA, Binney. Terr.
Moll. ii. p. 17, t. 67 (1852). No. 1.
- " 6. TEBENNOPHORUS CAROLINENSIS, Bosc. p. 80
(1830).
Binney, l. c. ii. p. 20, t. 63, f. 1, 2 (1852).
Limax togata, Gould. Invert. Mass. p. 3 (1841). No. 1.

- Fig. 7, 8. *TEBENNOPHORUS DORSALIS*, Binney. Limacidae, p. 14, Bost. Jour. iv. p. 174 (1842).
Binney, Terr. Moll. ii. p. 24, t. 53, f. 3 (1852). No. 2.
- “ 9, 10. *ARION FUSCUS*, Müller.
A. hortensis, Ferussac. Binney, l. c. ii. p. 27,
t. 64, f. 1, t. 65, f. 2 (1852). No. 1.
- “ 11, 12, 13. *LIMAX CAMPESTRIS*, Binney. Limacidae,
p. 9 (1842).
Boston Journal, iv. p. 169 (1842).
Binney, Terr. Moll. ii. p. 41, t. 64, f. 3 (1852). No. 4.
- “ 14, 15, 16. *LIMAX AGRESTIS*, Müller. Hist. Verm.
Part 2, p. 8.
Binney, l. c. ii. p. 36, t. 64, f. 2 (1852). No. 3.







NOTICES AND REVIEWS

OF

NEW CONCHOLOGICAL WORKS.

BY GEO. W. TRYON, JR.

I.—AMERICAN.

Index to Vols. I. to XI. of Observations on the Genus *Unio*, together with Descriptions of New Species of the family Unionidæ, and Descriptions of New Species of Melanidæ, Paludinæ, Helicidæ, etc. By ISAAC LEA, LL. D.

The above title indicates sufficiently the contents of this very valuable aid to the student of the Unionidæ. Both Dr. Lea and Dr. Jas. Lewis, of Mohawk, N. Y., the compiler of this work, deserve the best thanks of malacologists for the thorough manner in which their labor has been performed.

The American Naturalist. No. 7. September, 1867.

Artificial Oyster cultivation in France. By F. W. FELLOWES.

Proceedings of the California Academy of Natural Sciences. III.

Remarkable Instance of Vitality in a Snail. By R. E. C. STEARNS.

The species mentioned is *Helix Veatchii*, which was discovered to be living *six years* after it was collected.

The West Coast Helicoid Land Shells. By J. G. COOPER, M. D.

This paper is an attempt at a new arrangement into subgenera of the terrestrial mollusca of the Pacific States. The author rejects my genera, as adopted from Albers, in my monograph of Terrestrial Mollusca, because "the types of these subgenera differ so much from our species, that it is easy to separate the shells by good subgeneric characters; and as they inhabit

respectively South America, Europe and Cuba, it is very probable that the animals differ still more."

I agree entirely with Dr. Cooper that it would be best to take the shells only to guide us, while we continue ignorant of the animals; but I am entirely unable to perceive the differences in the shells to which he alludes. Dr. Cooper lays great stress upon the importance of the colored band upon the shells of many California *Helices*, relying upon it principally as a subgeneric distinction. As to *form*, *H. arrosa* and *H. redemita* have been found with exactly the form of *H. pomatia* of Europe, the type of the genus *Pomatia*!

The author further remarks that the Californian species are generally sufficiently distinct, although hybrids undoubtedly occur, and Dr. Wesley Newcomb, of Oakland, has raised many specimens in his garden which combine the characters of several species, so that it is impossible to determine their names. This is all truly lamentable, and tends to strengthen a suspicion that I have long entertained, that many of the so-called Californian species are really untenable.

It may be remarked that while Dr. Cooper refuses to consider the genera *Aglaja*, *Arionta* and *Polymita* to be represented in California, because their types belong to other geographical provinces, yet he unhesitatingly adopts *Hyalina*, *Conulus* and *Patula*, the types of which are European.

The species are all described, and grouped in a natural manner, forming a very useful paper.

Shells collected at Santa Barbara by W. Newcomb, M. D., in January, 1867. By ROBERT E. C. STEARNS.

List of Shells collected at Purissima and Lobitas, California, October, 1866. By ROBERT E. C. STEARNS.

Description of a New Species of Pisidium. By J. ROWELL.
Pisidium Angelicum, Rowell. Angel Island.

II.—FOREIGN.

BRITISH.

Conchologia Iconica. By LOVELL REEVE. 4to. Pts. 264, 265, with 16 colored plates.

UNIO. Plates 55, 56. June, 1867.

The following are described as new species:

U. Mexicanus, Sowerby. Mexico.

"*Angasi*, Lea, MS. Strangways River, Australia.

Unio gigas, Swainson, is described and figured as distinct from *Margaritana complanata*. In our opinion the species is identical.

Tellina. Plates 27 to 34. June, 1867.

The following appear to be new (that is, there are no references to descriptions):

<i>T. rotundata</i> ,	Sowerby.	Hab. ?
“ <i>cuneata</i> ,	“	“
“ <i>brevirostrata</i> ,	“	St. Blas.
“ <i>unifasciata</i> ,	“	Hab. ?
“ <i>subovata</i> ,	“	New Zealand.
“ <i>Taylori</i> ,	“	Mexico.
“ <i>pieta</i> ,	“	Hab. ?
“ <i>planulata</i> ,	“	“
“ <i>impressa</i> ,	“	“
“ <i>Belcheriana</i> ,	“	“
“ <i>costata</i> ,	“	Philippines.

Anodon. Plates 10 to 15. June, 1867.

The following are described as new:

<i>A. areolatus</i> ,	Sowb.	Hab. ? (Probably S. American.)
<i>A. simplicidus</i> ,	Parr.	“ (European, and <i>not</i> new.)
<i>A. atrovirens</i> ,	Shuttl.	Lago di Mosano. (Same remark applies.)

A. Bengalensis, Sowerby. Bengal.

A. subreniformis, “ Lake Nyassa.

Sp. 30, *A. undulatus*, Say, is a *Margaritana*.

“ 47, *A. subcylindracea*. Lea. Oak Orchard Creek is in New York, not “New Orleans.”

Contributions to Indian Malacology. No. 8. List of Estuary Shells collected in the delta of the Irawady, in Pegu, with descriptions of the new species. By WM. T. BLANFORD. (With three plates.) From the Journal of the Asiatic Society of Bengal, xxxvi. 1866.

<i>Assiminia rubella</i> ,	<i>Tectura fluviatilis</i> ,
<i>Iravadia</i> , n. g. (Rissoïdæ),	<i>Auricula nitidula</i> ,
<i>Iravadia ornata</i> ,	<i>Plecotrema Cumingiana</i> ,
<i>Neritina Peguensis</i> ,	<i>Amphibola Burmana</i> ,
<i>Larina</i> ? <i>Burmana</i> ,	<i>Martesia fluminialis</i> ,
<i>Sphenia perversa</i> ,	<i>Scaphula deltae</i> .

Annals and Magazine of Natural History. No. 115. July, 1867.

Remarks on Pyrula (Fulgur) carica (Lamarck), and *Pyrula (Fulgur) perversa* (Lamarck). By T. GRAHAM PONTON.

The author, for reasons given, "reluctantly" concludes that the above two species are identical. We can relieve his mind by assuring him that they are very distinct, and that he has apparently confounded with the *carica* other American species in his vars. β and γ .*

On the Shell Structure of Spirifer cuspidatus, and of certain allied Spiriferidae. By WM. B. CARPENTER, M. D.

In the last issue of this Journal (vol. iii p. 201, 1867) we noticed a paper by Dr. Carpenter, on the shell structure of *Spirifer cuspidatus*, published in the Ann. and Mag. Nat. Hist., London, Jan., 1867; and stated that he there emphatically denies that this is a punctate shell, and says he thinks that the specimens examined by Mr. Meek belong to another genus. Although this is correct, so far as regards Dr. Carpenter's statements in the paper noticed, he has since published another paper on this subject, from which it is evident that our notice of the first one alone may, without further explanation, do both of these gentlemen some slight injustice, by leaving on the minds of those who may not see their papers the impression that there is a conflict of opinion between them, which is not the case, as may be seen from the following statement of facts:

In the first place, Mr. Meek published a paper in the Proc. Acad. Nat. Sci. Philada. for December, 1865, p. 275, in which he says he has found the shells of several American species very similar to *Spirifer cuspidatus*. Sowerby (some of which were formerly generally referred to that species), to show under the microscope, by transmitted light, a distinctly punctate structure, the punctures being very minute and irregularly scattering. He also stated that, in the few examples of these shells of which he had been able to see the interior, they were found to possess a curious internal tube attached to the inner side of a kind of deep-seated pseudo-deltidium, precisely as in a genus *Syringothyris*, proposed by Prof. Winchell, for similar shells supposed by the latter gentleman to be without traces of punctures. Mr. Meek, however, suggested that he was much inclined to think that specimens of the typical *Syringothyris*, in a more nearly perfect state of preservation than those examined by Prof. Winchell, would yet be found to be punctate.

Mr. Meek further states that, on examining a specimen sent by Mr. Thomas Davidson to Mr. Worthen, from Melicent, Ireland, as a typical example of *Spirifer cuspidatus*, he found it to be also punctate, like the American shells. He did not, however, conclude from this that Dr. Carpenter had been mistaken in all

* For a list of the species of *Busycon*, see Am. Jour. Conch. iii. p. 184.

his numerous examinations of that species, which he had pronounced without punctures, but suggested that there might be two very similar, but really quite distinct forms in the British carboniferous rocks, confounded under the one name *S. cuspidatus*.—that is, one with a punctate structure, and one without it, --and stated that some one provided with duplicate British specimens ought to examine them carefully, to see if any were punctured, and if so, to make sections across the beak to see if this structure is coincident with the presence of the internal tube of *Syringothyris*; stating at the same time that such differences, if they really exist, would show this type to differ from *Spirifer* proper (supposing the latter to be impunctate and without the internal tube), upon as important characters as those separating *Spiriferina* from *Spirifer*, and *Cyrtina* from *Cyrtia*.

On seeing a notice only of this paper, Dr. Carpenter supposed Mr. Meek had called in question the accuracy of his original investigations of the structure of *S. cuspidatus*, and re-examined all his old preparations, as well as numerous fragments of other specimens sent to him from various British localities, and found them all, as he had long since published, without traces of punctures. Hence he published the paper first noticed by us, and expressed the opinion that Mr. Meek had either mistaken little specks on the surface of the shells examined by him for punctures, or that they belonged to another genus. Mr. Meek, however, after a careful examination, not only of the species first investigated by him, but of several other closely allied species not previously examined, including Prof. Winchell's typical specimens of *Syringothyris*, still maintained that all of these shells are really punctate (Am. Jour. Sci. May, 1867, p. 407).

On receiving chippings from all of these shells from Mr. Worthen, Prof. Winchell and Mr. Meek, Dr. Carpenter at once satisfied himself that they are all *unquestionably punctate*. He then obtained several specimens of the shells always regarded as the typical *S. cuspidatus*, from Melicent, Ireland, and found some of them punctate, and others not; and on making sections across the beak, as suggested by Mr. Meek, he ascertained that *those with the punctate structure also possess the internal tube and false deltidium of Syringothyris*; while *those without the punctate structure have neither the tube nor the internal lamina* (see Ann. and Mag. Nat. Hist. July, 1867, p. 68). So it will thus be seen that at the same time that these developments fully confirm Dr. Carpenter's original examinations of the true *S. cuspidatus*, they also fully and completely establish not only all of Mr. Meek's statements of facts, but equally confirm his deductions from analogy respecting the existence of two types amongst the British shells usually referred to *S. cuspidatus*.

Dr. Carpenter very justly remarks in his last paper, referred to above, that "it would be difficult to find a more significant proof of the value of microscopic tests than these results afford." We may also add, that it would be exceedingly difficult to conceive of a more forcible illustration of the necessity for the utmost caution in identifying specimens from distant localities, or widely different geological horizons, under the same specific names. If two types associated together in the same beds are so exceedingly alike, that even the very highest authorities have always regarded them as being *specifically* identical, turn out, upon careful microscopical investigation, to be not only distinct *species*, but even to belong to different *genera* or *subgenera*, how much more probable is it that most, if not all, of those few forms thought by some to be mere varieties of the same species, ranging from the silurian to the carboniferous, or farther, would be found specifically distinct, if we could only know all the details of their anatomical structure, now forever lost through agency of the process of fossilization?

Note on Assiminea Francesiæ. By Dr. J. E. GRAY.

On the species of the genera Latiaxis, Faunus and Melanatria. By Dr. J. E. GRAY.

Latiaxis Mairæ and *L. purpurata*, and *L. pagoda, textilis, Eugenie* and *nodosa*, are respectively said to belong to two species only.

Faunus ater, terebralis, Cantori and *pagoda*, are asserted to belong to one species.

Melanatria fluminea and *plicata* are only varieties of *M. spinosa*. "A series of specimens from the same locality show the variations in the surface on which these dealers' species are professed to be distinguished, which should be treated as the names given to flowers by nurserymen and florists are by the botanist, as they are scarcely worthy the attention of the scientific conchologist. The effect of this needless multiplication of names has been to almost entirely prevent conchology being studied as a science."

No. 116. August, 1867.

On Waldheimia venosa, Solander, sp. By THOMAS DAVIDSON.

On the Occurrence of Diplommatina Huttoni in Trinidad.
By R. J. LECHMERE GUPPY.

This is the second Indian Land Shell found inhabiting the West Indies,—the other species being *Ennea bicolor*. As it is

exceedingly unlikely that these species have been introduced by man, and flourished since, for years, the author suggests their migration by means of a supposed tertiary continent of Atlantis. (Questionable.)

Conchological Gleanings. By Dr. E. VON MARTENS.

V. *On the different ages of Trochus neloticus L., and Tr. maximus, Koch.*

VI. *On the species of Argonauta.*

Proceedings of the Zoological Society of London. 1866. Part II.

Descriptions of fifteen new Species of Land and Fresh-water Shells from Formosa, collected by Robert Swinhoe. By HENRY ADAMS.

<i>Nanina (Acusta) assimilis,</i>	<i>Ennea (Elma) Swinhoei,</i>
<i>Helix (Plectotropis) fulvicans,</i>	<i>Cyclotus Swinhoei.</i>
“ <i>(Camcena) Bairdi,</i>	“ <i>minutus,</i>
“ “ <i>succincta,</i>	<i>Alyceus (Dioryx) Swinhoei.</i>
<i>Bulimus (Amphidromus) Formosensis,</i>	<i>Pupinella (Pupinopsis) Swinhoei,</i>
<i>Clausilia (Laciniaria) exilis,</i>	<i>Limnea Swinhoei,</i>
“ <i>(Phaedusa) Formosensis,</i>	<i>Segmentina Swinhoei,</i>
	<i>Unio Swinhoei.</i>

Characters of Six New Australian Land Shells. By JAMES C. COX, M. D.

<i>Helix Porteri,</i>	<i>Helix corticicola,</i>
“ <i>conscendens,</i>	<i>Helicina diversicolor,</i>
“ <i>fenestrata,</i>	<i>Pupina pineticola.</i>

List of Shells collected by Samuel White Baker, Esq., during his recent Explorations in Central Africa. By HENRY ADAMS.

<i>Unio Bakeri, H. Ad.</i>	Lake Albert N'yanza.
“ <i>acuminatus, H. Ad.</i>	“ “

PART III.

List of Land and Fresh-water Shells collected by Mr. E. Bartlett on the Upper Amazons, and on the River Ucayali, Eastern Peru, with descriptions of new Species. By HENRY ADAMS.

<i>Rumina (Oboliscus) pusilla,</i>	<i>Aperostoma connivens,</i>
<i>Clausilia (Nenia) Bartlettii,</i>	<i>Bartlettia, nov. gen. (Family</i>
<i>Otostomus pulcherrimus,</i>	<i>Etheriidae).</i>
“ <i>Bartlettii,</i>	<i>Bartlettia Stephanensis, Mori-</i>
“ <i>scitus,</i>	<i>cand.</i>

Descriptions of Six New Species of Shells, and Note on Opisthostoma de Crespignii. By HENRY ADAMS.

- Nassodonta*, n. g., *Clausilia* (*Phædusa*) *similaris*,
 “ *insignis*, Riv. Peiho, Formosa,
 China, *Diplommatina* (*Diancta*) *Mar-*
Frembleya, n. g. (*Chitonidæ*), *tensi*. Hab. ?
 “ *egregia*, Hab. ? *Anodonta Swinhoei*, Formosa.
Spatha Baikii, River Niger.

On Opisthostoma. H. Blanford, with the description of a new Species from the neighborhood of Bombay, and of the animal and operculum. By WM. T. BLANFORD.

O. Fairbanki.

FRENCH.

Memoires de l'Academie Imperiale des Sciences de St. Petersburg. 7th Series, XI. No. 3. 1867.

Ueber das Centralnervensystem und das Gehörorgan der Cephalopoden. By PH. OWSJANNIKOW and DR. A. KOWALEOSKY. (With five plates.)

Journal de Conchyliologie. 3d Ser. VII., No. 4. Paris. Oct., 1867. (With two plates.)

Sur l'Anatomie des Lyria. By DR. P. FISCHER.

Catalogue des Mollusques testacés marins des côtes de l'Espagne et des îles Balcares (continued). By DR. J. G. HIDALGO.

Purpura Barcinonensis.

Notes sur quelques espèces de Mollusques fluviatiles de l'Amérique du Nord. By W. G. BINNEY.

The following are the most important of Mr. Binney's Notes, which are principally made from the examination of specimens in the collection of the Museum at Paris, and from very complete manuscript lists of species and synonymy, compiled by and in possession of M. Deshayes :

- Limnæa strigosa*, Lea. Preoccupied by Brongniart, 1810.
 “ *columellaris*, Adams. Preoccupied by Sowerby.
 “ *navicula*, Val. The type is a *L. columella*, Say.
 “ *subulata*, Dunker. Preoccupied by Sowerby, 1837.
 “ *cornea*, Val. Likewise employed by Brongniart.
 “ *lubrosa* is a variety of *L. catascopium*.
 “ *gracilis*, Jay. Preoccupied by Zietzen, 1830-34.

M. Deshayes proposes to change the name to *L. Haldemani*.

Physa globosa, Hald. Since employed by Morelet (Journ. de Conch.), 1866.

Physa scalaris, Jay. This name is also employed by Dunker, 1845. Jay's species undoubtedly constitutes the type of a new genus.

Planorbis Liebmanni, Dunker. This species, or a closely related one, is labelled at the Jardin des Plantes with the ticket "*Pl. rotundatus*, Jan, Texas. Coll. Férussac."

Pl. regularis, Lea. Preoccupied by Marcel de Serres, 1818.

Ancylus Drouetianus, Bourg., is an Algerian species.

Ampullaria borealis, Val. = *Natica heros*, by Valenciennes' own writing upon the margin of a copy of his work in the possession of M. Crosse.

Paludina multicarinata, Haldeman. Valenciennes gave Mexico as the habitat, but the type specimens have the locality "Philippines" attached, in his own handwriting. In the present age no conchologist would be misled on such a subject, because the relations of genera, as well as groups of species of lesser value, to the countries which they inhabit, are more clearly understood.

Paludina lineata, Küster, is restored by Mr. Binney in place of his own *P. contectoides*. He explains the cause of the mistake, into which he was led by a typographical error.

Paludina lineata, Valenciennes (not Küster). Valenciennes writes on the margin of the copy of his work above alluded to, respecting the locality,—"*C'est faux, elle vient de l'Inde.*"

Paludina cornea, Val. The type specimens are marked identical with *decisa*, Say, by Valenciennes himself.

Paludina castanea, Val., is nothing else but a very large *P. achatina*.

Description d'espèces inédites provenant de la Nouvelle-Calédonie. By H. CROSSE.

Succinea Montrouzieri, *Melanopsis Gassiesiana*.

Description de trois nouvelles espèces de Cyliindrella. By DR. L. PFEIFFER.

C. Crosseana, Mexico. *C. Gassiesi*, Mexico.

C. Tryoni, Mexico.

Diagnoses de Coquilles nouvelles de l'île Maurice. By A. MORELET.

Pupa brevis, *Pupa Modiolinus*,

" *Caldwelli*, *Physa cernica*,

Neritina Mauritanica.

Description de deux Helices nouvelles d'Espagne et des îles Baléares. By J. G. HIDALGO.

Helix Velascoi, *Helix Cardonæ.*

Description d'une Hélice nouvelle de Mayotte. By H. CROSSE.

Helix Bigoti.

Diagnoses Molluscorum novorum. By H. CROSSE.

Voluta Rückeri. Swan River, Australia.

Nassa Moreleti. Hab.——?

Bulinus Membriculus. Rep. Equador.

Limicolaria Hidalgoi. Africa?

Helix leucoleuca. Vitian Archipelago.

Succinea Wrighti. China.

Plecotrema Binneyi. Shark Bay, Australia.

Melampus flexuosus. “ “

Diplommatina paradoxa. Oceanica?

Note sur trois espèces fossiles de Toscane. By O. SEMPER.

Variétés. Promenade malacologique à l'Exposition Universelle de 1867 (second article). By H. CROSSE.

Bibliographie.

Under the title “Nouvelles,” Mr. Crosse informs us that the magnificent collections of Deshayes have been purchased by the Ecole des Mines, for one hundred thousand francs.

Mollusques Nouveaux, Litigieux ou Peu Connus. By M. J. R. BOURGUIGNAT. 6th part. January, 1866.

Arion Mabillianus, France. *Ferussacia Bugesi,* France.

“ *tenellus,* “ “ *Paladilhi,* “

“ *anthracius,* “ “ *Hydrobia Moitessieri,* “

Helix Paladilhi, “ “ *Masclaryana,* “

Ferussacia Moitessieri, “ “ *Anodonta elachista,* “

7th PART. February, 1866.

Letourneuxia Numidica. *Zonites Pazi.* Spain.

Limax Xanthius. Nassau. *Ancylus Isseli.* Egypt.

Krynichillus eustrictus. Beyrut. *Pomatias Letourneuxi.* Algiers.

Milax Barypus. Nazareth. *Hydrobia Reboudi,* “

Daudebardia Letourneuxi. Bône. *Unio Maccarthyanus.* “

Revue et Magasin de Zoologie. By M. F. E. GUERIN-MENEVILLE. Vol. xix., 2d series, No. 10. August, 1867.

Malacologie du Département de l'Hérault. By M. PROSPER-ANTOINE MOITESSIER (continued).

Cecilianella lactea, n. sp.

Actes de la Société Linnéenne de Bordeaux. xxvi. Part i. 1867.

Malacologie terrestre et d'eau douce de la Région Intra-Littorale de l'Aquitaine. By J. B. GASSIES.

The following are new :

<i>Limax arenarius</i> ,	<i>Succinea stagnalis</i> ,
<i>Bythinia Baudoniana</i> ,	<i>Unio Danielis</i> .

G E R M A N .

Archiv für Naturgeschichte. By Dr. F. H. TROSCHEL and Dr. R. LEUCKART. 32d year. 5th part. Berlin, 1866.

Bericht über die Leistungen in der Naturgeschichte der Mollusken während des Jahres 1865. By Dr. F. H. TROSCHEL.

A very complete notice of the conchological publications of the year, embracing over fifty pages.

Archiv für Naturgeschichte. 33d year. Part I. Berlin, 1867.

Anatomie von Helicina titanica. By Dr. CASPAR ISENKRAHE.

Ueber die Gattung Cremnobates, Blauf. By Dr. F. H. TROSCHEL.

ERRATA TO MR. CONRAD'S PAPERS.

For "Body Bay" read Bodega Bay, p. 193.

In Catalogue of Mactridæ,

Add—1a. MACTRA GRANDIS, Lamarck, over the synonym *M. grandis*, p. 32.

Add HARVELLA PACIFICA, Conrad, next to H. ELEGANS, p. 34.

Leave out "31. T. GUADELUPENSIS," p. 37.

" "69. T. SPENGLERI," p. 39.

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REPORT OF RECORDER.

During the year there have been elected six members and seventy-three correspondents.

Two members have resigned and one correspondent has died.

Twenty-one papers have been accepted for publication, by the following authors.

T. A. Conrad,	5	Geo. W. Tryon, Jr.,	5
W. H. Pease,	4	Prof. Theo. Gill,	2
Dr. O. A. L. Mürch,	1	Prof. S. S. Haldeman,	1
A. O. Currier,	1	Dr. S. B. Howell,	1
Wm. M. Gabb,	1		

The section now numbers 27 members and 73 correspondents.

By-laws for the government of the section were adopted March 19th, 1867.

Respectfully submitted,

S. R. ROBERTS,
Recorder.

MEMBERS.

Those marked with a * are founders.

	Elected.
* Brown, A. D., Princeton, N. J.	Dec. 26, 1866.
Baird, Prof. S. F., Washington,	May 2, 1867.
* Binney, W. G., Burlington, N. J.,	Dec. 26, 1866.
* Beadle, Rev. E. R., Philadelphia,	"
* Conrad, T. A.,	"
* Cope, E. D.,	"
C. J. Cleborne, M. D., U. S. A.,	March 7, 1867.
* Ford, John, Philadelphia,	Dec. 26, 1866.
* Howell, S. B., M.D., Philadelphia,	"
* Hayden, F. V., M.D.,	"
* Haldeman, Prof. S. S., Columbia, Pa.,	"
* Jeanes, Joseph, Philadelphia,	"
* Lea, Isaac, L.L.D.,	"

* Leidy, Joseph, M.D., Philadelphia,	Dec. 26, 1866.
Lewis, Samuel, M.D., “	April 4, 1867.
* Mactier, Wm. L., “	Dec. 26, 1866.
Nolan, E. J., M.D., “	May 2, 1867.
* Parker, C. F., “	Dec. 26, 1866.
* Phillips, John S., “	“
* Ruschenberger, W. S. W., M. D., Phila.,	“
* Roberts, S. R., Philadelphia,	“
* Redfield, J. H., “	“
* Swift, Robert, “	“
* Tryon, Geo. W., Jr., “	“
Vaux, Wm. S., “	Aug. 1, 1867.
Wilstach, Wm. P., “	“
* Wheatley, Chas. M., Phoenixville, Pa.,	Dec. 26, 1864.

CORRESPONDENTS.

	Elected.
Adams, Arthur, London,	Aug. 1, 1867.
Adams, Henry, London,	“ “
Agassiz, Prof. Louis, Museum of Comparative Anat.	March 7, 1867.
Angas, Geo. F., Port Jackson, Australia,	Aug. 1, 1867.
Anthony, John G., Cambridge, Mass.,	March 7, 1867.
Baudon, Aug., M. D., France,	Aug. 1, 1867.
Benoit, Luigi, Messina,	Aug. 1, 1867.
Benson, H., England,	“ “
Bland, Thos., New York,	March 7, 1867.
Bourguignat, J. R., Paris,	Aug. 1, 1867.
Busch, G. von dem, Bremen,	Aug. 1, 1867.
Carpenter, P. P., Montreal, C. E.,	March 7, 1867.
Castello de Paiva, Baron de, Lisbon,	Aug. 1, 1867.
Cailliaud, Fredk., Nantes,	Aug. 1, 1867.
Cavada, Col. F. F., Trinidad,	May 2, 1867.
Chenu, J. C., M.D., Paris,	Aug. 1, 1867.
Chitty, Hon. Edw., Kingston, Jamaica,	Aug. 1, 1867.
Chittenden, Hon. L. E., New York,	March 7, 1867.
Cooper, J. G., M.D., San Francisco,	Aug. 1, 1867.
Cox, J. C., M.D., Sidney, N. S. W.,	Aug. 1, 1867.
Crosse, H., Paris,	Aug. 1, 1867.
Currier, A. O., Grand Rapids,	Oct. 3, 1867.
DeCamp, Wm. H., M.D., Grand Rapids,	March 7, 1867.
Deshayes, G. P., Paris,	March 7, 1867.
Drouet, Henry, Troyes,	Aug. 1, 1867.
Dunker, Wm., Marburg, Hesse,	March 7, 1867.

Fischer, Paul, M.D., Paris,	Aug. 1, 1867.
Frauenfeld, G. Ritter von, Vienna,	March 7, 1867.
Gabb, Wm. M., San Francisco,	March 7, 1867.
Gassies, J. B., Bordeaux,	Aug. 1, 1867.
Gill, Theo., Washington,	March 7, 1867.
Gray, J. E., London,	March 7, 1867.
Gonzales, H. Hidalgo, Madrid,	Aug. 1, 1867.
Hall, Jas., Albany,	March 7, 1867.
Hanley, Sylvanus, Middlesex,	Aug. 1, 1867.
Holmes, F. S., Charleston, S. C.,	March 7, 1867.
Hyatt, Alpheus, Salem, Mass.,	May 2, 1867.
Jay, John C., M.D., Mamaroneck, N. Y.	March 7, 1867.
Jeffreys, J. Gwyn, London,	Aug. 1, 1867.
Kirtland, J. P., M.D., Cleveland,	March 7, 1867.
Krauss, Fredk., Stuttgart,	March 7, 1867.
Küster, H. C., M.D., Cassel,	Aug. 1, 1867.
Lewis, Jas., M.D., Mohawk, N. Y.,	March 7, 1867.
Mabille, Jules, France,	Aug. 1, 1867.
Meek, F. B., Washington,	March 7, 1867.
Mohrenstern, G. S. von, Vienna,	Aug. 1, 1867.
Montrouzier, R. P., New Caledonia,	Aug. 1, 1867.
Mörch, O. A. L., Copenhagen,	Aug. 1, 1867.
Morelet, Arthur, Dijon, France,	Aug. 1, 1867.
Morse, Edw. S., Portland,	March 7, 1867.
Mousson, Albert, Zurich,	March 7, 1867.
Newcomb, Wesley, M.D., Oakland, Cal.,	Aug. 1, 1867.
Paz, Patricio Maria, Madrid,	March 7, 1867.
Pfeiffer, Louis, M.D., Cassel,	Aug. 1, 1867.
Phillippi, R. A., M.D., Santiago, Cuba,	Aug. 1, 1867.
Poey, F., Havana, Cuba,	Aug. 1, 1867.
Prime, Temple, New York,	March 7, 1867.
Recluz, M. C., Paris,	Aug. 1, 1867.
* Remond, Aug., San Francisco,	
Salvin, Osbert, London,	Dec. 5, 1867.
Saussaye, Petit de la, Paris,	Aug. 1, 1867.
Stabile, Abbe Jos., Milan,	Aug. 1, 1867.
Souverbie, M., Bordeaux,	Aug. 1, 1867.
Sheldon, Prof. D. S., Davenport, Iowa,	March 7, 1867.
Showalter, E. R., M.D., Uniontown, Ala.,	March 7, 1867.
Stearns, R. E. C., San Francisco,	Aug. 1, 1867.

* Deceased.

Stimpson, Wm., Chicago,	March 7, 1867.
Terver, A. P., Lyons,	Aug. 1, 1867.
Thomson, John H., New Bedford,	March 7, 1867.
Troschel, Prof. F. H., Bonn,	Aug. 1, 1867.
Vaillant, Leon, M.D., Paris,	Aug. 1, 1867.
Van Beneden, P. J., Bruxelles,	March 7, 1867.
Willis, J. R., Halifax,	May 2, 1867.
Winchell, Alex., Ann Arbor,	May 2, 1867.

REPORT OF THE CORRESPONDING SECRETARY.

Letters have been addressed to the following gentlemen, announcing their election as Correspondents:

Prof. Louis Agassiz, Cambridge, Mass.
 John G. Anthony, Cambridge, Mass.
 Geo. French Angas, Australia.
 Henry Adams, London.
 Arthur Adams, London.
 Thomas Bland, N. Y.
 H. Benson, Cheltenham, England.
 J. R. Bourguignat, Paris.
 Dr. August Baudon, Bauvais, France.
 Luigi Benoit, Messina, Sicily.
 Hon. L. E. Chittenden, New York.
 Dr. P. P. Carpenter, Montreal, C. W.
 Col. F. F. Cavada, Tr. de Cuba.
 M. H. Crosse, Paris.
 Dr. J. C. Chenu, Paris.
 Hon. Edward Chitty, Jamaica.
 Fredk. Cailliaud, Nantes, France.
 Dr. J. C. Cooper, San Francisco.
 Dr. J. C. Cox, Sidney, N. S. W.
 M. G. P. Deshayes, Paris.
 Prof. Wm. Dunker, Marburg, Hesse.
 Wm. H. De Camp, M. D., Grand Rapids, Mich.
 Henri Drouet, Troyes, France.
 Dr. Paul Fischer, Paris.
 Prof. Theo. Gill, Washington, D. C.

Wm. M. Gabb, San Francisco.
 Prof. J. E. Gray, London.
 J. B. Gassies, Bordeaux, France.
 Dr. J. Gundlach, Havana, Cuba.
 Prof. James Hall, Albany, N. Y.
 Prof. F. S. Holmes, Charleston, S. C.
 Alpheus Hyatt, Salem, Mass.
 Sylvanus Hanley, Middlesex, England.
 J. Gonzales Hidalgo, Madrid, Spain.
 J. C. Jay, M. D. Rye, N. Y.
 J. Gwyn Jeffreys, London.
 J. P. Kirtland, M. D., Cleveland, Ohio.
 Frederick Krauss, Stuttgart.
 Dr. H. C. Küster, Cassel.
 James Lewis, M. D., Mohawk, N. Y.
 Prof. Albert Mousson, Zurich, Sw.
 Edward F. Morse, Salem, Mass.
 Prof. F. B. Meek, Washington, D. C.
 R. P. Montrouzier, New Caledonia.
 Arthur Morelet, Dijon, France.
 Prof. O. A. L. Mörch, Copenhagen.
 Jules Mabille, Dinan, France.
 Wesley Newcomb, M. D., Oakland, Cal.
 Temple Prime, New York.
 Patricio Maria Paz, Madrid, Spain.
 Dr. Louis Pfeiffer, Cassel.
 Prof. F. Poey, Havana, Cuba.
 Baron de Castello de Paiva, Lisbon.
 Dr. R. A. Phillippi, Santiago, Cuba.
 M. C. Recluz, Paris.
 Wm. D. Stimpson, M. D., Chicago.
 E. R. Showalter, M. D., Uniontown, Ala.
 G. B. Sowerby, London.
 Prof. D. S. Sheldon, Davenport, Iowa.
 Petit de la Saussaye, Paris.
 R. E. C. Stearns, San Francisco.
 Abbe Joseph Stabille, Milan.
 M. Souverbie, Bordeaux, France.
 J. H. Thompson, New Bedford, Mass.
 Prof. F. H. Troschell, Bonn, Prussia.
 A. P. Terver, Lyons, France.
 Prof. Geo. Ritter von Frauenfeld, Vienna.
 Prof. P. J. Van Beneden, Bruxelles, Belgium.
 Prof. Von Mohrenstern, Vienna.
 Dr. Leon Vaillant, Paris.

Prof. Von den Busch, Bremen.

J. R. Willis, Halifax.

Alexander Winchell, Ann Arbor, Mich.

Letters have also been written to the following gentlemen :

April 22d, 1867.—W. T. Blanford, Calcutta, proposing an exchange of publications and specimens.

Dr. Paladilhe, Montpellier, France ;

Jules Mabilhe, Paris ; proposing exchanges.

May 7th.—D. Rafael Arango, Cuba, proposing an exchange of specimens.

Sept. 11th.—Hon. L. E. Chittenden, N. Y., accepting proposals to send shells.

Sept. 19th.—Sylvanus Hanley, accepting proposals for an exchange.

W. T. Blanford, Calcutta, accepting proposals for an exchange.

Letters have been received from the following gentlemen, acknowledging their election as correspondents :

May 9th.—D. S. Sheldon, Davenport, Iowa.

May 11th.—James Lewis, M. D., Mohawk, N. Y.

Wm. Stimpson, M. D., Chicago.

May 15th.—E. R. Showalter, M. D., Alabama.

May 18th.—J. G. Anthony, Cambridge, Mass.

May 23d.—Temple Prime, N. Y.

May 29th.—J. C. Jay, M. D., Rye, N. Y.

E. S. Morse, Salem, Mass.

June 1st.—Thos. Bland, N. Y.

June 28th.—Alexander Winchell, Mich.

July 12th.—Prof. Theo. Gill, Washington, D. C.

July 31st.—Col. F. F. Cavada, Cuba.

August 12th.—Prof. F. B. Meek, Washington, D. C.

Letters have been received from the following gentlemen, offering to send shells, or exchange specimens :

1867. *Sept. 4th*.—Hon. L. E. Chittenden, N. Y.

Sylvanus Hanley, Middlesex, Eng.

Sept. 5th.—Prof. J. E. Gray, British Museum.

W. T. Blanford, Calcutta.

All of which is respectfully submitted.

E. R. BEADLE,
Corres. Sec'y.

December 5th, 1867.

CONSERVATOR'S REPORT,

For 1867.

The following donations to the Conchological Cabinet have been received during the year.

From G. A. LATHROP, Michigan. Eighty-four species of shells from Saginaw River and its vicinity.

DR. E. W. HUBBARD, Staten Island, N. Y. *Helix Jacksonii*, Bland.

JOHN KRIDER, Philadelphia. Six species of S. American Land Shells.

GEO. W. TRYON, JR., Philadelphia. Six specimens of shells exhibiting internal structure; *Magilis antiquus*, from the Red Sea, *Helix Parkeri*; 95 species selected from the Poulson Collection, and about 200 additional duplicate species from the same collection. Four specimens of Cephalopods in spirits, and 48 species, numerous specimens of Australian shells, together with a collection of Cephalopods and other naked mollusks in spirits.

J. H. THOMSON, New Bedford, Mass. *Helix Stuartiae*, Sowb. Philippines, and *Mortucuta Gouldii*.

A. O. CURRIER, Grand Rapids, Mich. Four types of new species and thirty-nine species, numerous specimens from Grand Rapids, Mich.

J. B. ESHLEMAN, Lancaster Co., Penn. *Melania attilis*, Lea.

J. R. WILLIS, Halifax, N. S. Twenty species of marine shells from Nova Scotia.

C. F. PARKER, Camden, N. J. Fifteen species and eleven sections of shells.

S. R. ROBERTS, Philadelphia. Six species.

SYLVANUS HANLEY, Middlesex, England. One hundred and eighty-four species of marine shells, from Italy.

F. H. ALDRICH, Troy, N. Y. Twenty-eight species of land and fresh water shells, collected in the vicinity of Troy, New York.

DR. H. C. WOOD, JR., Philadelphia. Four species of land shells from Texas.

- REV. E. R. BEADLE, Philadelphia. *Navea Neweombii*; perforating *Haliotus* from Lower California; three species of Cuban shells and two specimens of *Pinna squamosa* from the Mediterranean Sea; *Maetra lateralis*, Say; *Voluta Turneri*; a large collection of Solens, Maetræ, &c., and five species of terrestrial shells from Syria and Java.
- COL. F. F. CAVADA, Trinidad, Cuba. Thirty-one species, numerous specimens of Cuban land shells.
- E. R. SHOWALTER, M. D., Uniontown, Ala. One hundred and fifty-six species, 3900 specimens of Unionidæ and Melania, chiefly from Alabama.
- ISAAC LEA, LL.D., Philadelphia. *Septifer Trautwiniana*, type; *Columna Hainesii*, and *Helix Peliomphila*, from Japan.
- W. H. PEASE, Honolulu, Sandwich Islands. Types of sixty-four species of Polynesian shells described by him.
- GEO. SCARBOROUGH, Atchison, Kansas. Two species.
- WM. M. GABB, San Francisco, Cal. Fifteen species from California.
- O. A. L. MÖRCH, Copenhagen, Denmark. One hundred and six species, numerous specimens of shells from Canary Islands, Greenland, Arabia and Chili.
- S. S. HALDEMAN, Columbia, Penn. His type specimens of the Genera *Limnea*, *Planorbis* and *Physa*.
- W. H. HARTMAN, M. D., West Chester, Penn. Three species.
- DR. GEO. H. HORN, Philadelphia. Five species from Texas.
- DR. JOS. LEIDY, Philadelphia. One species of *Sphærium*, and eleven species of land and fresh water shells, from Western Virginia.
- E. HALL, Athens, Ill. One hundred and four species of American terrestrial and fluviatile shells.
- JOHN CASSIN, Philadelphia. *Purpura patula*.
- THOS. BLAND, New York. Three species of *Helix*.
- DR. J. C. COX, Sydney, Australia. One hundred and twenty-two species, numerous specimens of Polynesian shells.
- W. P. WILSTACH, Philadelphia. Ninety-one species of shells from Australia, S. America, Palestine, &c.
- W. NEWCOMB, M. D., Oakland, Cal. Six species, fifteen specimens of shells.
- F. A. RANDALL. Ten species from Alleghany River.
- WM. S. VAUX, Philadelphia. *Bulimus*, from Peru.
- R. E. C. STEARNS, San Francisco, Cal. Seven species from California.

PROF. E. D. COPE, Philadelphia. A collection of *Unios*, *Melania*, &c., from Virginia.

JOHN FORD, Philadelphia. Beautiful suites of specimens of *Unio nasutus*, *U. complanatus*, *U. heterodon*, *U. ochraceus*, *Margaritana undulata*, *Anodonta undulata* and *Sphaerium transversum*.

MISS ANNA ABBOTT. One good specimen of *Venus intapurea*, Conrad, from Florida.

DR. AUG. BROT. Geneva. One hundred and forty species, numerous specimens of land and fresh water shells.

J. L. JULIUS. *Cassia*, from Trinidad.

J. H. REDFIELD, Philadelphia. Four species of *Marginella*.

AND. J. BENNETT. Twenty-three species of *Unionidæ*, from the Sciota River.

JAS. LEWIS, M.D., Mohawk, N. Y. Four species of *Amnicola*, from Mohawk, N. Y.

JACOB ENNIS. *Vivipara lineata*, Val., from St. John's River, Florida.

Types of Rafinesque's *Unios*, with the original labels in his handwriting, were obtained from the collection of the late Chas. A. Poulson, by purchase.

In addition to the above, the magnificent collection of over one hundred thousand specimens, of ten thousand species, deposited by Mr. Geo. W. Tryon, Jr., has been received and incorporated with the main collection, making our cabinet richer than any other in the world in specimens, and the richest in species, with one exception—that of the British Museum.

A collection of one hundred and eight species of American Shells has been sent to Dr. J. C. Cox, of Sydney, Australia, in exchange for Polynesian shells, received from him. A similar collection has been sent to M. Luigi Benoit, of Sicily, and a smaller one to M. Spiridione Brusina.

The various collections received during the year have been arranged, labelled and deposited in their proper places in the cabinet, by Messrs. Geo. W. Tryon, Jr., Chas. F. Parker, S. R. Roberts and others, who have devoted much time and labor to the work. The proper systematic arrangement has been somewhat interfered with in consequence of the very limited accommodation afforded our magnificent collection in our present building, nor can any remedy for this inconvenience be at present suggested.

Dr. S. B. Howell has kindly undertaken the arrangement of

our alcoholic collection, and has made considerable progress therein.

Opportunity having offered to acquire about 1000 species, not yet in our museum, including a portion of the collection of shells belonging to the late Hugh Cuming, of London, a subscription list was opened, and our appeal having been answered encouragingly, the shells were ordered, and some of them are now on their way to the Academy.

Although the Conchological Section of the Academy has been in existence but a little over a year, yet an observation of its present condition cannot, we think, fail to be gratifying to all interested in the science for the encouragement of which it was instituted. While the augmentation of the collection during that time has been beyond all precedent, a reference to the list of our contributors will prove that the interest taken in the department is not confined to our members alone, but is manifested by others who are not so intimately connected with us, both at home and abroad.

In conclusion, we beg leave to congratulate those present that, through their instrumentality, the interest heretofore manifested in our science has been greatly increased, and to hope that their efforts may be still farther successful in the future, in gaining for Conchology that prominent position among the natural sciences which it so well deserves.

Respectfully submitted by
JOSEPH LEIDY,
Conservator.

LIBRARIAN'S REPORT.

There have been presented during the past year to the Conchological Section of A. N. S., 140 volumes, and 298 periodicals, pamphlets, &c. Of these works, 195 are from Authors, 12 from Editors, 14 from Societies, 12 from Smithsonian Institution, 5 from Publication Committee of Conchological Section A. N. S., and 140 bound volumes, and 60 pamphlets, &c., from G. W. Tryon, Jr.

In addition to the above, there have been presented to the A. N. S., 21 volumes, pamphlets, &c.

Respectfully submitted,
C. F. PARKER,
Librarian.

DONATIONS TO THE LIBRARY.

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- On Microstelma and Onoba, two forms of Rissoïd Gastropods; with notices of new species of the latter from Japan. Svo. pamphlet, 1863. From the Author.
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- On the animal and affinities of Fenella; with a list of the Species found in the seas of Japan. Svo. pamphlet, 1864. From the Author.
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REPORT OF PUBLICATION COMMITTEE.

The Publication Committee report, that during the year 1867 they have published for the Section three Nos. of the "American Journal of Conchology," and three Nos. of the "Monograph of Terrestrial Mollusca," besides "the By-Laws of the Conchological Section," and "Price Lists of Books and Specimens for sale," and part of the "Catalogue of Recent Mollusca." As the subscription to the Journal, for the year, will necessarily include our proceedings of this evening and any papers that may on this occasion be ordered to be printed, and as the committee have several unpublished papers as well as printed lithographic plates in hand, they prefer to include in the exhibit of their transactions an estimate of Part 4 of the Journal.

Two hundred and fifty copies of the Journal, Parts 1, 2 and 3, have been printed, aggregating over three hundred octavo pages, and it is probable that the 4th and concluding part of the current volume will embrace about one hundred pages, making in all 400 pages.

Two hundred and fifty extra copies of the By-Laws, 25 pp. 8 vo. and one hundred copies each of the "Price List of Shells," that of duplicate books, and the "Monograph of Terrestrial Mollusca;" also, fifty copies of part 1 of the "Catalogue and Synonymy of the Genera, Species and Varieties of Recent Mollusca," have been issued.

Fifty-two copies of the Journal have been sold by subscription, and seventeen copies have been distributed in exchange or by resolution of the Section to the following institutions of learning and individuals :

Academy of Natural Sciences, Philadelphia.

H. Crosse and J. Fischer, Editors *Journal de Conchyliologie*, Paris, 2 copies.

Edward S. Morse, Salem, Mass.

American Journal of Science and Arts, New Haven, Conn.

Arthur Morelet, Dijon, France.

E. R. Showalter, M.D., Uniontown, Ala.

Zoological Society, London.

Dr. F. H. Troschel, Bonn, Prussia.

K. K. Zoologisch-botanischen Gesellschaft, Wien, (Austria).

N. Y. Lyceum of Natural History.

Boston Society of Natural History.

Prof. F. Poey, Havana, Cuba, Conductor of the "*Repertorio fisico-natural*," &c.

Dr. P. P. Carpenter, Montreal, Canada.

Prof. O. A. L. Mörch, Museum, Copenhagen, Den.

Essex Institute, Salem, Mass.

Smithsonian Institution, Washington, D.C.

A number of copies of the Journal have also been distributed to authors of papers contributed to its pages, no charge being made for them in such cases; many authors have also availed themselves of the privilege of obtaining 20 copies of their papers, at the expense of the Publication Committee. Your committee do not mention this, however, as matter of regret, because they believe the circulation of the Journal and substantial interest of the Section will be much advanced by a liberal policy in this respect.

Forty-seven copies of the Monograph of Terrestrial Mollusca have been sold by subscription.

Following the direction of the By-laws, every paper describing new species has been fully illustrated, so that the present volume of the Journal will contain twenty-six lithographic plates, crowded with figures, (of which there are over four hundred). Of these plates 6 have been carefully colored by hand for the Journal, and 11 for the Monograph.

Your committee respectfully suggests to members the importance, by using the most strenuous personal influence, of giving to the Journal a circulation which, while lightening the responsibility of the Publication Committee, will at the same time make the Section better known at home and abroad, and more extensively interest naturalists in its welfare. In this connection, we are sorry to inform the Section that, so far from increasing, the circulation of the Journal has declined to the extent of 18 subscribers during the present year, and considerably more than half of the subscriptions yet remain unpaid. As a very large portion of the time of the acting Conservator was otherwise unoccupied, the Publication Committee have availed themselves of his skill in drawing on stone, and have taken upon themselves in return to pay three-fourths of the Conservator's salary for the present year.

Some time since, as many of the members are aware, Prof. S. S. Haldeman, of Columbia, Pennsylvania, generously presented to the Section, for the benefit of its Conservators' Fund, the entire remaining edition of his splendid work on the Limnæides of North America. We have collated the Parts and Plates of this work, and find that a slight expense will be necessary to render it available for sale. We propose shortly to present an estimate of this cost, and await the direction of the Section. Perhaps the expense might be paid out of the fund which will be benefited by its sale.

Respectfully submitted by

GEO. W. TRYON, JR.,

C. F. PARKER,

For Committee.

STORAGE

